a W. R. C. Smith publication

FIFTY CENTS

Textile Industries

Formerly "COTTON"

SEPTEMBER 1960

PRINTING (hand & machine)
automatic screen printing
methods and equipment,
flash aging,
hand screen printing,
surface printing
pages 101 through 124

COTTON RESEARCH CLINIC
full text of papers on
roving frame design,
roving package winding,
cotton quality relationships,
effect of fabric structure
on wrinkle-resistant cottons
pages 125 through 146

Stop wasting good fiber
at woole
page

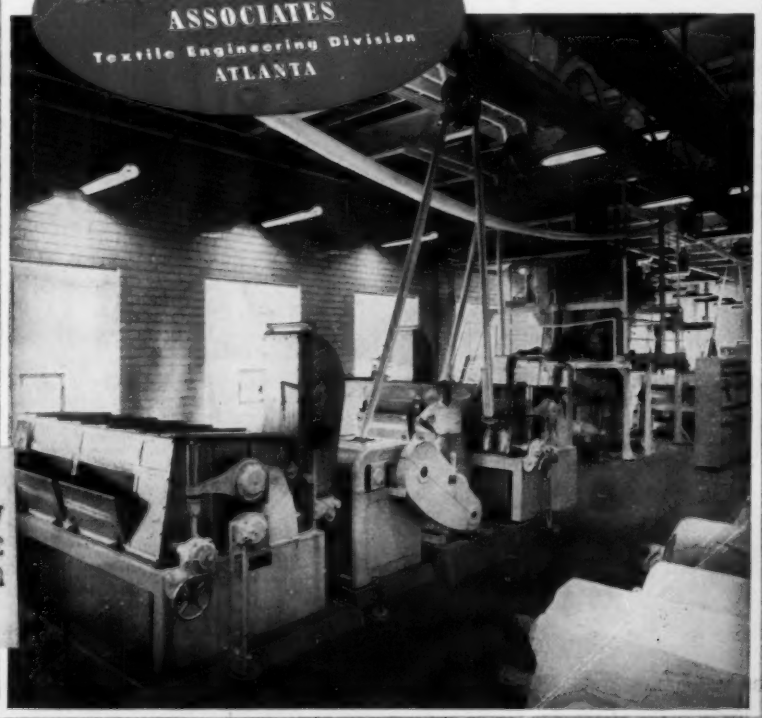
Textile Engineering
BLEACHING & FINISHING

Continuous processing in all phases of textile finishing has already proved its ability to cut production costs, increase production and overall profit.

Many leaders in the bleaching and finishing field have already tooled up to engage in this faster, more profitable form of production. On hand, to blueprint the modernization, the production layout, and the new buildings that house many of the nation's most modern operations, have been the skilled planners in the Textile Engineering Division of Robert and Company Associates.

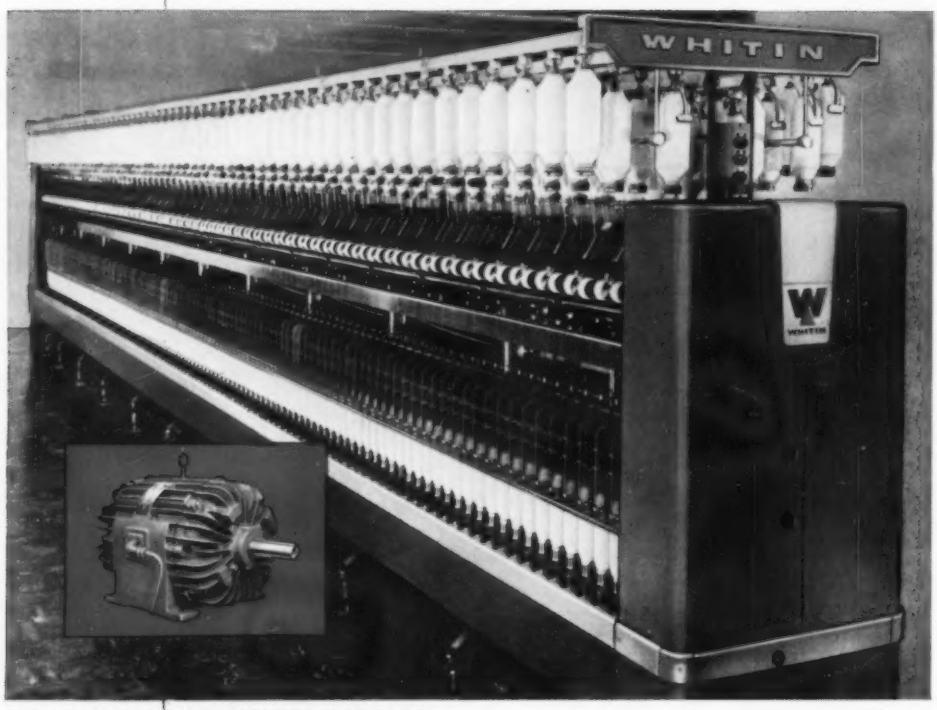
An engineering survey of your existing operations will enable you to better judge your expansion and profit potential, as our more than 40 years experience in all phases of textile engineering has helped others.

ROBERT AND COMPANY ASSOCIATES
Textile Engineering Division
ATLANTA

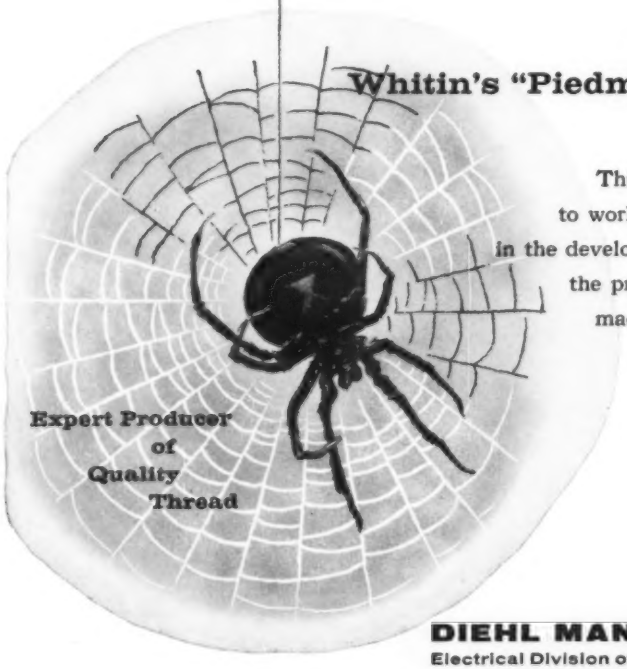


University Microfilms
313 No First St
Ann Arbor Mich 4

Next month—Greenville Show Preview



AT WHITIN MACHINE WORKS



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This is another example of DIEHL ability to work closely with machinery manufacturers in the development and manufacture of motors with the precise characteristics needed for efficient machine operation . . . an important reason for using DIEHL motors to power your equipment.

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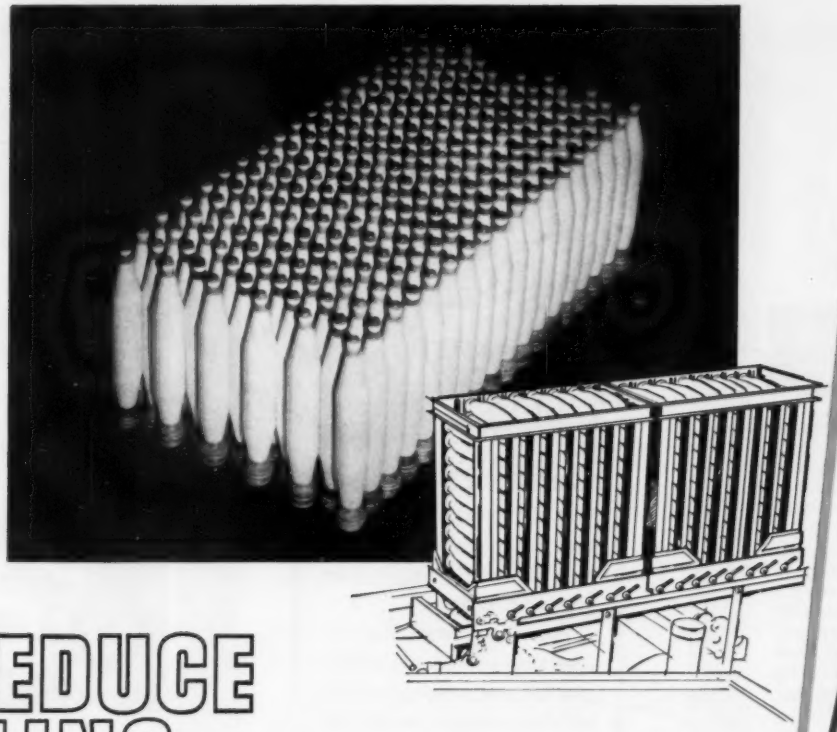

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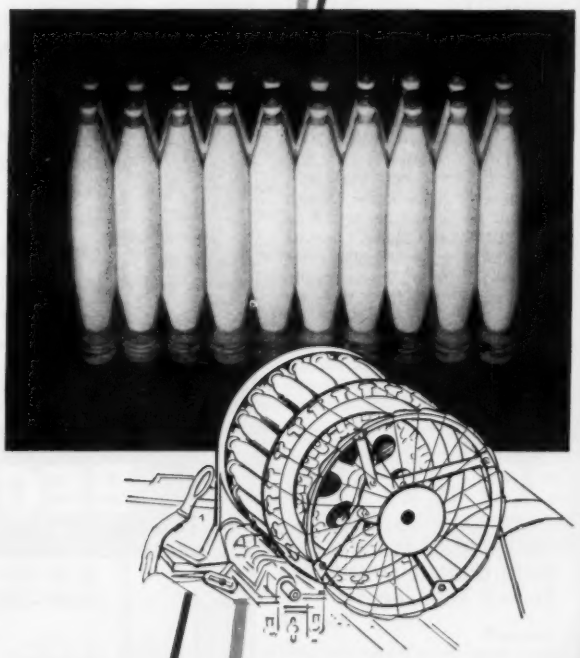

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This increased bobbin capacity, over the conventional Rotary Battery *eliminates much of the cost of delivering filling yarn to the loom.* More continuous loom operation, cleaner yarns and fewer cloth seconds are also direct advantages gained from the use of this magazine.

Compare the Draper Automatic Filling Magazine with the conventional battery and see for yourself the many benefits that can be obtained.

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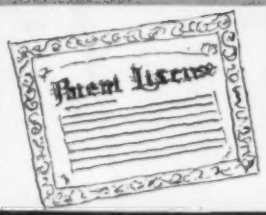

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Textile Industries

Formerly "COTTON"

SEPTEMBER 1960 VOL. 124, NO. 9

CONTENTS

WET PROCESSING

A series on printing by hand and by machine

102 **Automatic screen printing**

So far it has cut heavily into hand screen printing, but it is not a threat to roller printing. The trend to smaller yardage lots is bringing roller printers into the field; they are also attracted by its high-style possibilities.

107 **Flash aging**

The process is firmly established in the screen printing industry, each plant having developed its own arrangement of equipment and the procedure best suited to its individual needs.

110 **Hand screen printing**

A versatile tool for translating art into fabrics for an exclusive market.

114 **Surface printing**

Sometimes referred to as mechanized block printing, it gives patterns a hand-painted appearance and faithfully reproduces painted designs.

117 **Machines for automatic screen printing of textiles**

Handy chart with data on the following automatic screen printing machines which are currently available to U. S. manufacturers: Buser, Comerio Ercole, Reggiani, Stork, Thorne, Zimmer, Ichinose, and SACM.

97 The woes of wash-and-wear

112 Emphasis on "new" at AATCC convention

113 Single-bath method for dyeing wool and Dynel

116 Service life for outdoor fabrics increased by wet finishing

191 More on printing aniline black — formulas

COTTON RESEARCH CLINIC

Proceedings of the 1960 Cotton Research Clinic

Third installment of the full text of all papers presented at the eleventh annual Cotton Research Clinic.

125 **New developments in roving package winding**

129 **Recent developments in roving frame design**

132 **A new look at cotton quality relationships**

138 **Effect of fabric structure on wrinkle-resistant cottons**

WOOL

151 **Don't waste good fiber!**

Ways to minimize shrinkage at the woolen card.

CONTINUED ON NEXT PAGE ▶

Textile Industries

COTTON AND MAN-MADE FIBERS

147 **A report on fringe selvages**
The selvage from the shuttleless loom fabrics need offer no finishing problems, and cutters don't always need the conventional one.

167 **"How we improved spooling"**
Changing techniques and equipment in cleaning and materials handling upped efficiency.

169 **Gauges in Draper loom maintenance**
Article 7—Finding and keeping adequate picking power.

175 **The Starnes spinning system**
Model does spinning and winding simultaneously.

177 **Gin damage research intensified**
Highlights of the recent National Cotton Council Marketing Conference.

146 Progress report on spinning frame doffer shown in Georgia last year

KNITTING

181 **Too many missed picks?**
Here's an easy way to greatly reduce them on SCP and SCOP machines.

182 **Adjusting to double F-F knitting**
With the accepted practice of assigning two full-fashioned knitting machines per knitter, fixers (as well as knitters) have some adjustments to make. A mill man discusses them.

184 Per capita use of women's hose highest since 1950

DEPARTMENTS

9	Shorts and remnants	193	New product parade
85	News in brief	209	Free booklets
91	Technical developments	214	Personal notes
97	Executive views	216	Mill notes
99	Future events	219	Supplier notes
187	How others manage	224	Advertiser's index

EDITORIAL AND EXECUTIVE OFFICES: 806 Peachtree St., N. E., Atlanta 8, Georgia—Phone: TRinity 4-4462

George H. Dockray, *Editor*

J. Frank Guest, *Managing Editor*

Milton C. May, *Associate Editor*, P. O. Box 11015, Charlotte 9, N. C.

Stanley M. Suchecki, *Associate Editor*, P. O. Box 685, Ridgefield, Conn.

Jesse W. Ellington, *Associate Editor*

Ann W. Hardy, *Assistant Editor*

J. A. Moody, *Production Manager*

H. Redfern Hollins, *Director of Circulation*

John C. Cook, *Vice-Pres. & Business Manager*

Walter M. Mitchell, Jr., *Advertising Manager*

BUSINESS REPRESENTATIVES

BOSTON—Arthur C. Shaw, *27 Southgate Rd., Wellesley 81, Mass. (Phone: Cedar 5-3648).*

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LOS ANGELES—Warren R. Christian, *4140 Edenhurst Ave., Los Angeles 39, Calif. (Hollywood 2-1133).*

SAN FRANCISCO—Fred Jameson, *821 Edenburgh St., San Mateo, Calif. (Diamond 3-8806).*

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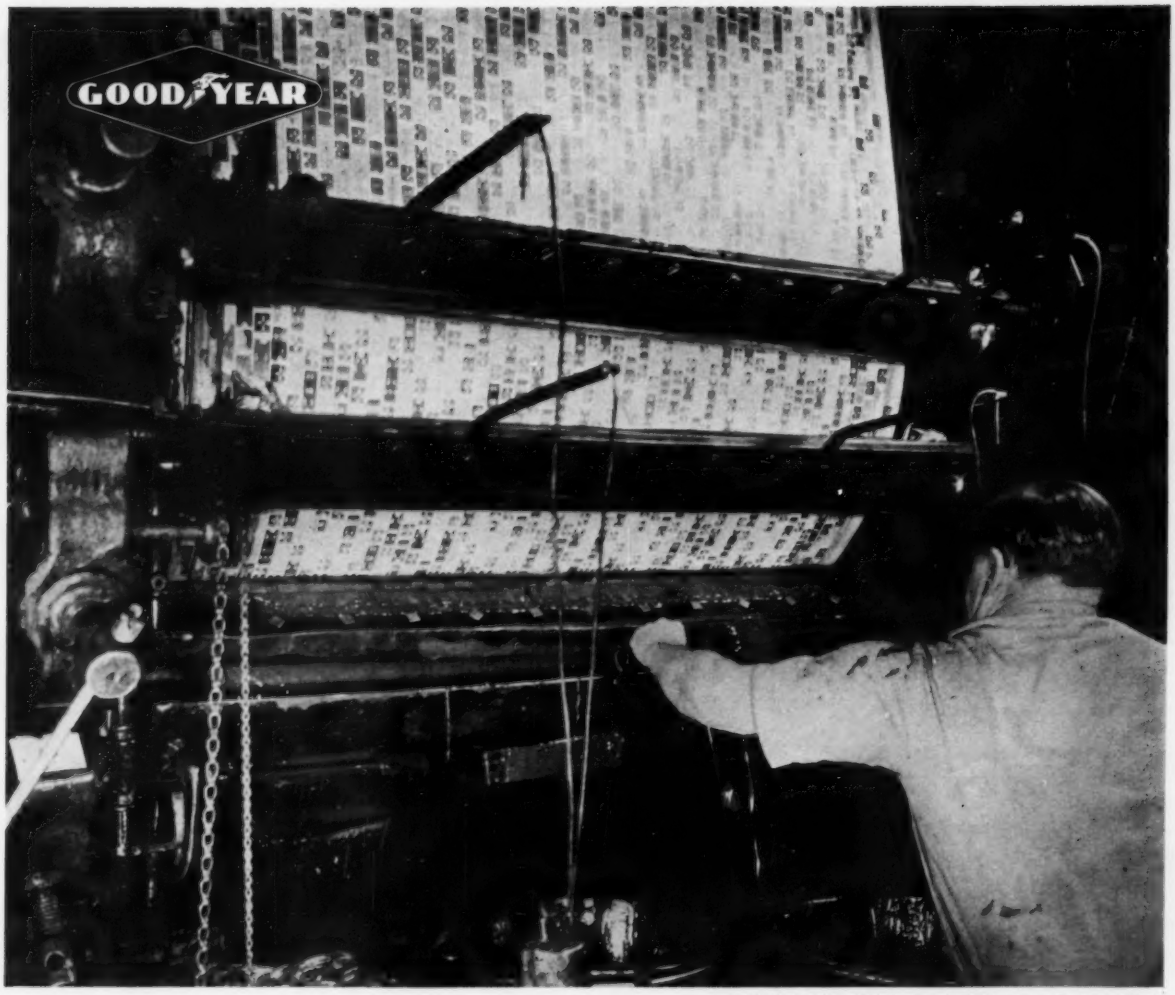

Photo courtesy of Union Textile Printers, Inc., Secaucus, N. J.

Prints are true blue *(or any color)* with CHEMIGUM LATEX

The big problem this manufacturer faced in making print colors and in the printing of textiles was "crocking." But he found a lasting solution in CHEMIGUM LATEX.

The "liquid lock" CHEMIGUM LATEX puts on pigments—even when applied to polyester fabric and acetate taffeta—keeps crocking to an all-time low. What's more, CHEMIGUM LATEX runs smoothly, doesn't break down, prevents ink build-up on the roller. And there's no problem to making any color in the rainbow "fast."

CHEMIGUM LATEX works wonders for textiles. Its adhesion, flexibility, light color and permanence, plus ease of compounding and processing make it ideal for binders, coatings, finishes and adhesives. For full details, including the latest *Tech Book Bulletins,* on CHEMIGUM LATEX, write Goodyear, Chemical Division, Dept. U-9439, Akron 16, Ohio.

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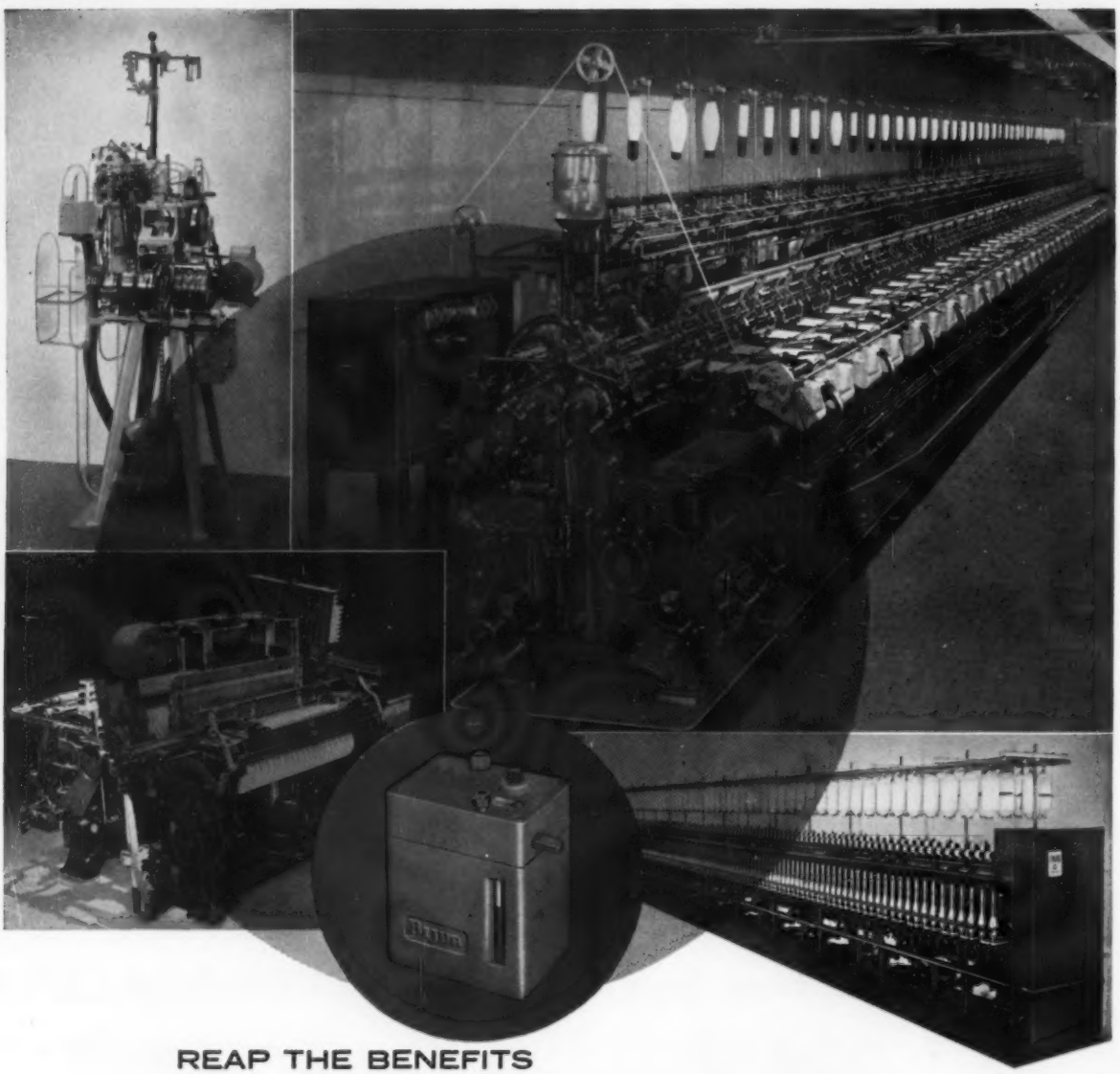
GOODYEAR

CHEMICAL DIVISION

Chemigum—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio



REAP THE BENEFITS

# of BIJUR Automatic Lubrication

Bijur-lubricated machines are found in every type of textile mill on the top textile machines.

These simple, rugged, reliable lubrication systems have only three elements—the lubricator pump, distribution tubing and Meter-Units. Yet they lubricate the most intricate textile machines *automatically*, prevent oil spots on work, or bearing failures. Every bearing gets the right amount of filtered oil at the right time. There's less chance of personnel injury or fire risk. Oil consumption and downtime are reduced. Machines and mill are kept cleaner.

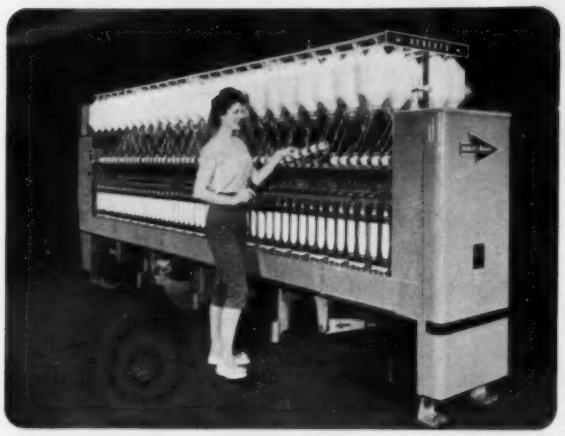
Why not install *Bijur* Automatic Lubrication on *your* machines and reap these benefits? We'll send further information on request.

BIJUR LUBRICATING CORPORATION
Rochelle Park, New Jersey

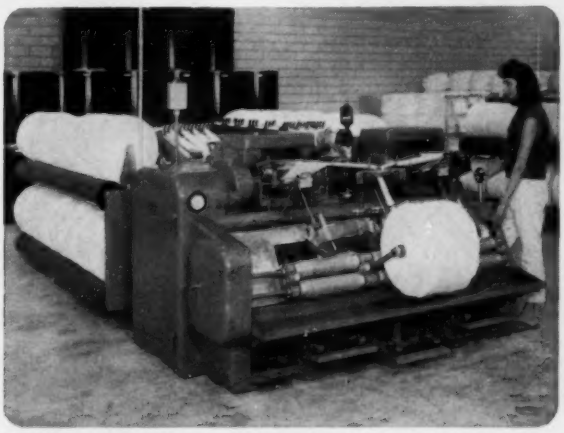
Pioneers in Automatic Lubrication

ROBERTS

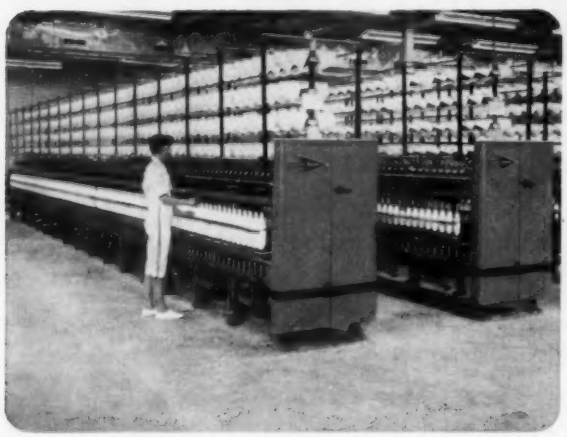
YARN MAKING MACHINERY
for Cotton, Worsted, or Long Fiber Systems



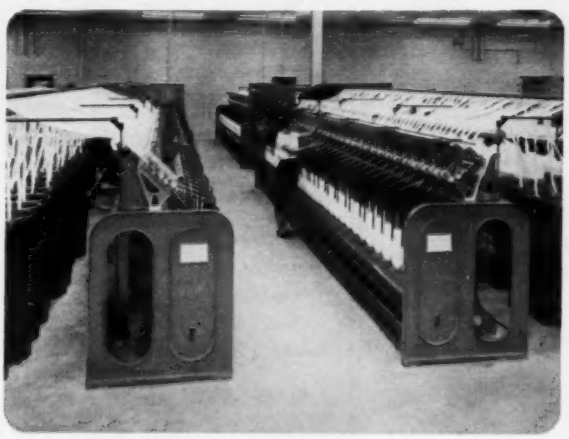
ROBERTS ARROW SPINNING for both cotton system and long fiber system yarn spinning for natural and synthetic fibers and blends. High speed, all ball bearing, big package Arrow Spinning Frames in 25-inch or 36-inch width. Exceptional flexibility and simplicity of operation in the manufacture of improved quality yarns at reduced costs and modest initial investment.



ROBERTS-TEMATEX worsted system preparatory machines, including ParaBlenders, ParaDrafters and AutoEveners, are rugged, high performance machines for pinning, parallelizing, drafting and blending worsted and synthetic fibers prior to roving and spinning, and in top making plants. AutoEvener automatically and instantaneously corrects delivered sliver weight to within plus or minus 1%.



ROBERTS TWISTERS for plying yarns are completely ball bearing equipped and designed for high speed ring twisting operations. 25- or 36-inch frames. Up to 3½-inch rings and 12-inch bobbins. Package weights 1¼ pounds on cotton, ¾ to 1 pound on worsted.



ROBERTS ROVING FRAMES are ball bearing rebuilt and feature all-new heavy duty ball bearing Roberts Double Apron Drafting Systems for cotton, short staple or long fiber synthetics, worsted and blends. 10x5 and 12x7 packages. Provisions for double headed spools.

Simplicity of design, rugged construction and high speed ball bearing operation are the trade marks of all Roberts Company machinery. Roberts also supplies rebuilt spinning frames and modernization change-overs for mills' existing machinery.

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SANFORD, NORTH CAROLINA

with
Naphthols
Vats
Sulfurs
Pigments

BLANDOFEN®

NONIONIC POLYMER EMULSIONS

give better finishes with increased fastness to wet and dry crocking

BLANDOFEN AC and **SL** in combination offer textile finishers a series of outstandingly effective anticrock agents for colored cottons and rayons, either alone or in blends with today's popular synthetic fibers. Together, these Blandofen products are particularly valuable for fabrics colored with naphthols or pigments.

BLANDOFEN combination finishes also add softness and a full appealing hand to textiles. No other softener, wax, or lubricant need be used with the Blandofen emulsions on either dyed or printed fabrics.

Although Blandofen AC contributes greatly to the prevention of crocking, Blandofen SL is necessary to provide the required plasticizing effect. Both agents are compatible with textile brighteners.

BLANDOFEN SL, also by itself, is an excellent textile softener. It is nonyellowing and is used to eliminate needle cutting, increase tear strength and abrasion resistance, improve the draping qualities of fabrics.

BLANDOFEN polymer emulsions are available in carloads, truckloads, or single drums. BLANDOFEN SL is also supplied in bulk. Write or call any Antara office for Blandofen samples, information, and technical assistance.

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SHORTS & REMNANTS

► Our editorial, "Cotton and the Welfare State" (TI for July, 1960, p 81), attracted some notice—favorable and otherwise. We had a three-page letter from **E. J. Overby,** director of the U. S. Department of Agriculture's Cotton Division (he didn't like it). And then a boll weevil was discovered in our circulation department, which we suspect was planted there by certain raw cotton interests. Of Dr. Overby's letter, more later.

Another Milestone

Olefin fibers are really taking the textile industry by storm, and now they're even invading the grass-skirt market:

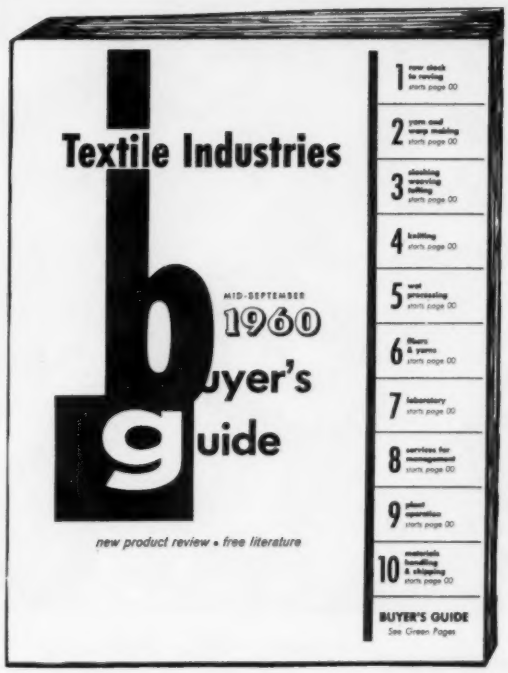
These dancers at the Hawaiian Room of the Hotel Lexington in New York have laid aside their grass skirts in favor of polypropylene. At least that's what Dawbarn Brothers, Inc., tells us.

► This we'd like to see: The application form for hotel reservations at the summer outing of the Piedmont Section, AATCC, at the Ocean Forest Hotel, Myrtle Beach, S. C., says, "All rooms have Mountain View." Well, we do have some far-sighted people in the textile industry; but in *all* rooms?

Straight and Narrow

Last June we gave you a little problem from L. A. Graham's book, "Ingenious Mathematical Problems

COMING LATER THIS MONTH



with (1) a review of equipment, supplies, and services made commercially available to the textile industry in the past 12 months; (2) free literature offered by suppliers to the industry; and (3) a complete buyer's guide with prime sources of more than 1000 items used in the manufacture of textiles.

and the OCTOBER issue of

with a complete and up-to-the-minute

GREENVILLE SHOW PREVIEW

What and whom you'll see at the 21st Southern Textile Exposition, Textile Hall, Greenville, S. C., October 3-7

Booth MICR-O-GRIND*

the proven flexible card clothing

Overseer of Carding in a S. C. Weaving Mill reports fewer neps and extended stripping cycles:

"We had to run some poor cotton. We tried 8 cards on the Micr-O-Grind needlepoint and immediately noticed a definite improvement in nep count. Cards ran twice as long between grindings. We have now converted all our cards to Micr-O-Grind."

A Superintendent of a Non-Woven Synthetic Mill reports:

"We're carding up to 22 lbs. per hour and our web looks better than ever. We've been able to take off the fancies on most of these cards."

Quality Control Engineer reports:

"Ends down per thousand spindle hours reduced 10%-15%."

Mill Owner reports:

"Four-way savings from Micr-O-Grind system. We grind the cards only four times a year, and then only for an hour. That adds up to about 2,000 lbs. increased production per card per year with a substantial labor saving to boot. We pay no more for Booth Micr-O-Grind than for conventional clothing."

A Booth representative can help you achieve the best in carding performance.

*PATENTED

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SHORTS & REMNANTS

(from page 9)

and Methods." Now here's another, contributed by our own ingenious **Walter M. Mitchell, Jr.:**

The object is to connect all the dots, using only six straight lines, and without lifting the pencil from the paper or retracing a line. Walter will provide the solution on request.

Let's Use Tex

"Please forward ten copies of [tex conversion chart]. We are very interested in following a standard system in designating yarns in all our operations, and we feel the tex system has finally solved this problem."

J. N. LEONARD
Catalina, Inc.
Los Angeles, Calif.

Others requesting copies of this chart included **James E. Tillman,** supt., Southern Elastic Corp., Hickory, N. C.; **J. F. Nicholl,** v-p—planning, Chicopee Mills, Inc., NYC; **William A. Scherrer,** ind. engr., Edmont, Inc., Coshocton, Ohio; **Cecil B. Ray,** asst. mgr., fin. dept., Pepperell Mfg. Co., Opelika, Ala.; **Paul D. Burnham,** chem., Wyandotte Worsted Co., Waterville, Me.; **Lawrence Travis,** Travis Fabrics, Inc., NYC; **Theodore S. Bartwink,** Ace Dyeing & Finishing Co., Inc., West Warwick, R. I.; **J. Robert Wagner,** dev. engr., Formex Co., Greeneville, Tenn.; **Walter J. Hynek,** res. div., Chicopee Mfg. Corp., Milltown, N. J.; **Norman Schneider,** The Jaunty Fabric Corp., Scranton, Pa.; and **A. B. Brooks,** Post Narrow Fabrics Co., Andover, Conn. The charts are free as long as they last.

Buy American

Here is a story which might provide some ammunition for the textile industry in its fight against imports, courtesy the Maine Sardine Council (which has import troubles of its own):

One of the daffiest of the old Brooklyn Dodgers, so the story goes, was Babe Herman. One day Babe

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GOOD INSURANCE

Clean and Rustproof Textile Equipment
The Absolutely Safe Way . . .

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2. IT IS NON-TOXIC— toxic vapors and risk of dermatitis are eliminated.

3. SAFE FOR ALL TEXTILES— rinses off with plain water or can be left in—safely.

Other Immunol Benefits . . .

1. ECONOMICAL— dilutes 1 to 20 in any water, costs less than 13c a gallon of cleaning solution.

2. PREVENTS RUST AND CORROSION— saves equipment, eliminates use of costly oils and rust preventives.

3. ODORLESS— increases operator efficiency and eliminates complaints.

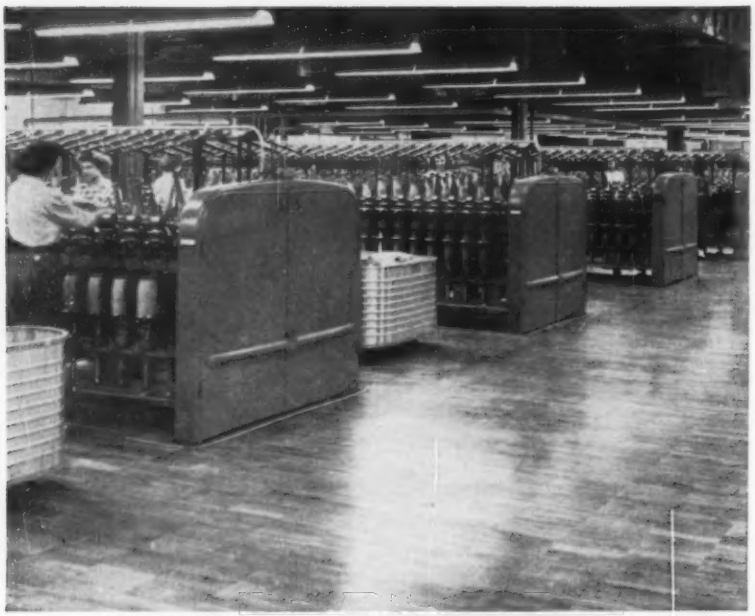
4. GIVES OUTSTANDING CLEANING AND SOLVENT ACTION
Cleans anything, fast—equipment, woodwork, plastic, glass and enameled surfaces. IMMUNOL washes off quickly and leaves no oily residue.

Check now on this safety-insuring, money-saving IMMUNOL "policy". Write, wire or call for a free sample of IMMUNOL and for the IMMUNOL Textile Bulletin.

HARRY MILLER CORP. HAMICO 4TH & BRISTOL STREETS PHILADELPHIA 40, PA.

Manufacturers of:
• IMMUNOL • GLYCOLA • POTENTOL
• FIBREGARD • REVERSOL • ACTIVOL
• FIRMTAL

HARRY MILLER CORP.
Original Products and Processes Since 1936
4th and BRISTOL STREETS • PHILADELPHIA 40, PA. • DAvenport 4-4000
Service Representatives in Principal Cities



DIRT-RESISTANT Tennantized floor allows faster sweeping. Saves manhours.

Why most money-making mills have TENNANT-maintained floors

Mills that make money *today* usually know their maintenance costs to a penny.

That's why about 9 out of 10 successful mills, large and small, use the TENNANT SYSTEM of Floor Maintenance.

They know, from their own cost records, that this system provides clean, bright floors *at the lowest cost per sq. ft. of any floor maintenance method* available today. Here's why:

SAVES MANHOURS—*Tennantized* floors have 3 times the dirt resistance of most textile floors. Saves cleaning time, cuts sweeping costs, etc.

How the TENNANT SYSTEM cuts floor care costs...

1 **SAVES TIME.** Dirt is easily wiped off surface.

2 **SAVES FLOOR SEAL.** Tennantized floors seldom need refinishing.

3 **SAVES BUFFING.** New method brightens floor; cuts buffing time as much as 80%.

REQUIRES LESS FLOOR SEAL—New custom-fitted TENNANT seals are *extra* durable, dirt-resistant and easy to clean. Cuts annual seal costs and recoating expense. WRITE TODAY *for full details. G. H. Tennant Co., 735K N. Lilac Drive, Minneapolis 22, Minn.*

OUR 90th YEAR TENNANT

The Textile Industry's Most Widely Used

FLOOR MAINTENANCE SYSTEM

Methods

Machines

Materials

FLOOR MAINTENANCE SYSTEMS

SHORTS & REMNANTS

(from page 10)

sat down at a lunch counter in Augusta, Me., and asked for a sardine sandwich.

"Do you want domestic or imported sardines?" the waitress asked.

"What's the difference?"

"The imported ones cost 50 cents more," the waitress explained.

"Then I'll take the domestic," snorted Babe. "A guy's gotta be nuts to pay passage money to America for some lousy sardines."

Labeling Law, Six Months After

We checked up on observance of the Labeling Law recently, during a visit to a couple of Atlanta department stores. We can report that garment manufacturers are observing it to the letter, judging from these labels we collected:

Call for Wash-and-Wear

In the "Dear Addy" department of the newsletter published by Batten, Barton, Durstine & Osborn, the advertising people, this letter appeared recently:

"Dear Addy:

"To what do you attribute the demise of the gray flannel suit as Madison Avenue's uniform of the day?

Was it fear of social ostracism or the lack of exclusivity resulting from wide acceptance of the garment among non-U types?

"CHIC"

"Dear Chic:

"It didn't hold a crease.

"ADDY"

Background for Terry Weavers

Old friend and long-time TI contributor **T. Hargreaves,** formerly superintendent of Caldwell Linen Mills, Iroquois, Ont., and now living in retirement in Blackpool, England, has some technical data on terry towels and related products which he would like to sell. The material has been bound into five books, and consists of 50 articles from TEXTILE INDUSTRIES and other American and English publications. For further information, write to the editors of TI.

Data on Man-Made Fibers

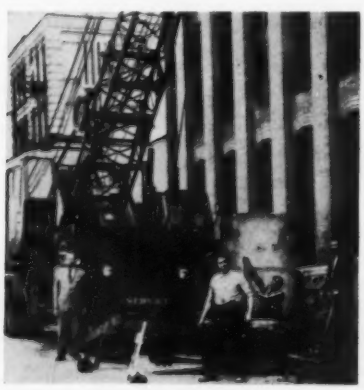
"Please send us 25 copies of the supplement to the August, 1959, issue of TEXTILE INDUSTRIES . . . covering Properties and Uses of the Man-Made Fibers . . ."

HORACE L. FREEMAN
Carolina Narrow Fabric Co.
Winston-Salem, N. C.

The 1960 revision of this chart is now in print; single copies are available to subscribers without charge.

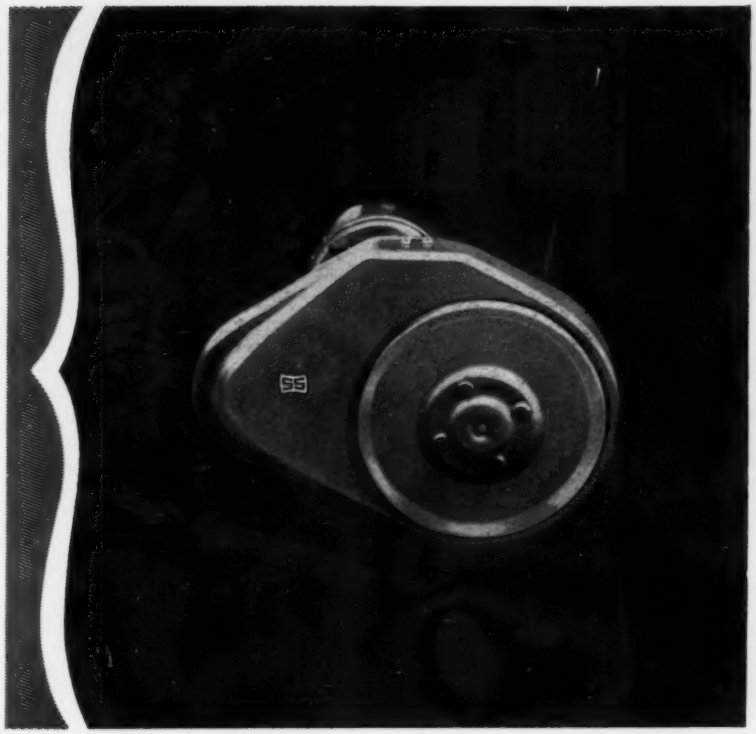
First Shovelful Dept. (Cont.)

After a first quick glance at the photo below, we thought that the famous Brooks Brothers establishment was getting its face changed. We assumed that the gentleman standing under the crane, wearing a three-button suit and we presume a repp tie and button-down collar shirt, was one of the officials of that well-known institution.



A second and more careful look told us another story—the Banner Yarn Dyeing Corp. of Brooklyn is building for the future. We are most

Continued on page 16



SOUTHERN STATES CD-2 CARD DRIVE COMBINES INTO ONE UNIT ALL OF THE FEATURES WANTED FOR COTTON CARDS

Here is why we honestly believe the Southern States CD-2 Card Drive is the safest, simplest, most efficient individual drive on the market today:

Finger-tip control. No changes in operating procedure. Unit is controlled by simple clutch lever in both starting and hand stripping.

Full speed in seconds. A 1½ hp high torque card motor brings card into full operation, seconds after clutch is engaged.

Safety engineered. All belts and moving parts are covered. Starting and idling is accomplished by simple clutch lever.

Rugged construction. The entire unit is built for heavy-duty service: steel main stand; cast iron jackshaft bracket and main pulley; cast aluminum cover. Ball bearing throughout.

Easy installation. Fits any cotton card. Minimum number of holes to drill in frame. Drive pulley, collar and clutch are preassembled and slip on to shaft using existing keyway.

Get the facts from your Southern States representative or write for Bulletin 301-a.

SOUTHERN STATES
EQUIPMENT CORP.
HAMPTON, GEORGIA

What these little numbers

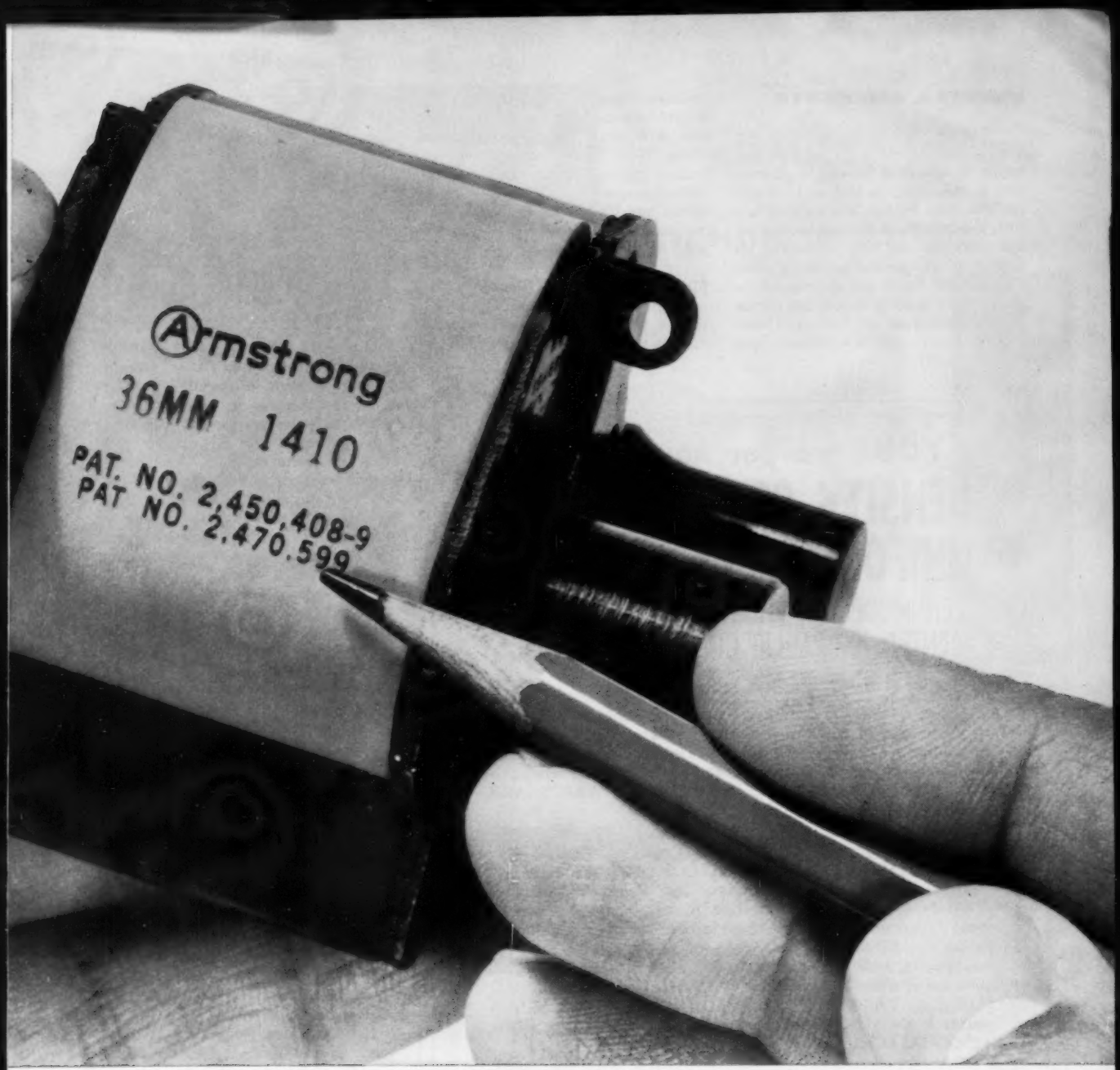
These are the numbers of three of the patents granted to Armstrong scientists for inventions on synthetic spinning aprons . . . inventions which have helped significantly to make spinning more efficient and more economical.

In all, fifteen patents related to synthetic aprons have been granted to Armstrong inventors. Accotex Aprons have been made under one or more of these patents since 1939.

These patents cover such things as the cord interliner in Accotex Aprons which provides dimensional stability and prevents stretching.

"Controlled friction" on fiber-handling surfaces is another invention. This process gives aprons just the right frictional characteristics.

Under another patent, a special electrolyte is blended into the rubber compounds to help prevent build-up of loose fibers on apron surfaces.



mean to you

Good performance of Accotex Aprons doesn't just happen. It's built in, as the result of continuous research and development . . . under mill conditions as well as in the laboratory.

This intensive research work will no doubt produce other patentable inventions that will help you turn out more and better yarn. Armstrong Cork Company, Industrial Division, 6409 Ivy Street, Lancaster, Pennsylvania.

Armstrong

ACCOTEX APRONS

1860-1960 Beginning our second century of progress

SHORTS & REMNANTS

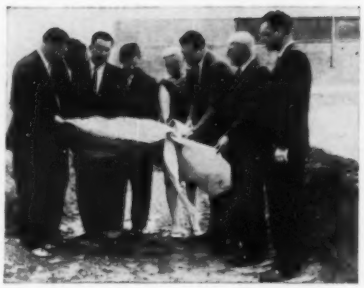
(from page 13)

happy to note that the cast of characters in this scene is just as it should be. The man in the Brooks Brothers suit, presumably a Banner executive, has probably just left his office for a look at the ground-breaking ceremonies, and he is not getting in the way. There is no shovel in his hands.

The gentleman at the right does have a shovel, and we presume that he knows how to use it, unlike some shovel wielders in our experience (see S & R for August, 1959, and June, 1960). We congratulate the Banner people for not getting in the way of people who know what they're doing; and it's our guess that at Banner, folks are not miscast—no square pegs in round holes.

First Shovelful Dept. (Cont.)

Continuing our series on unlikely shovel wielders, and similar fauna, here is news from Engineers Hill, at



Plainview, L. I. In our long study of first shovelfuls, that's the deepest hole we've seen. We predict protests from the Foundation Diggers' Union if this becomes accepted first-shovelful practice.

In this scene, the participants have discarded their shovels and are going over the plans to determine how to get out of the excavation they've dug. Oh, yes, what you see here is the beginning of the new Ultrasonic Industries, Inc., plant.

By the way, the gentleman who is fourth from the left is **Paul M. Platzman,** whom Ultrasonic's release modestly describes as their "dynamic young president." And he was our dynamic young New York editor for three or four years in the early '50's.

Wants Loom Fixing Data

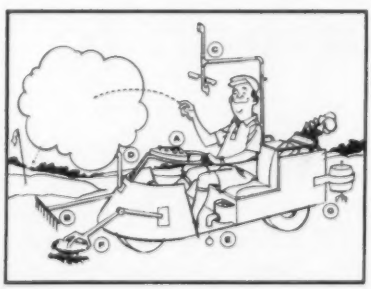
". . . we are in need of a series of loom fixing manuals on Draper . . ."

JOSEPH A. MURRAY
Supt., Southern Weaving Co.
Greenville, S. C.

The book "Draper Loom Fixing," by Ben H. Crawford, is available with a subscription to TI. The current series of articles, "Gauges in Draper Loom Maintenance," will be reprinted in book form after all of the articles have been published.

Automatic Golf

Here is a new nontextile development passed along to us by Micro Switch, division of Minneapolis-Honeywell Regulator Co.:



By installing switches on his golf buggy, Homer Turfchopper was able to raise his morale while lowering

Continued on page 20

Does YOUR warper have . . .

● DENSITY CONTROL?

● UNIFORM SPEED CONTROL?

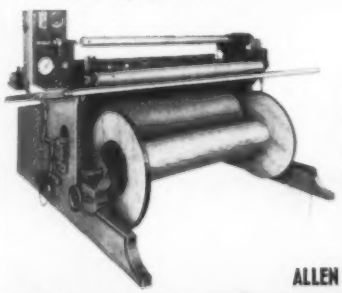
ALLEN MODEL "G", the modern warper with PATENTED HYDRAULIC CONTROL, gives you. . .

Uniform Density of Warp throughout entire build-up.

ALLEN PATENTED HYDRAULIC CONTROL maintains uniform pressure at all times between the beam surface and the pressor roll which drives the beam. The nip between this roll and beam is always at same distance and angle, so yarn tension is kept uniform. HARD-SHELL, SOFT-CENTER WARPS ARE POSITIVELY ELIMINATED.

Controlled Uniform Yarn Speed, variable at will.

ALLEN PATENTED HYDRAULIC CONTROL, maintains uniform pressure between beam surface and driving roll, assures positively uniform yarn speed—free from the abrupt jumps in speed experienced with now obsolete methods of constantly adjusting the drive speed in an endeavor to compensate for warp build-up. In addition, ALLEN VARIABLE SPEED DRIVE enables the operator to SELECT EXACTLY THE RIGHT SPEED FOR THE YARN BEING RUN. This means your ALLEN warper is always adjusted for MAXIMUM production consistent with QUALITY.



Don't put up with old-style warping!

Put this modern warper concept to work along with your other modern equipment. Time-proved, patented,—no other warper has these features.

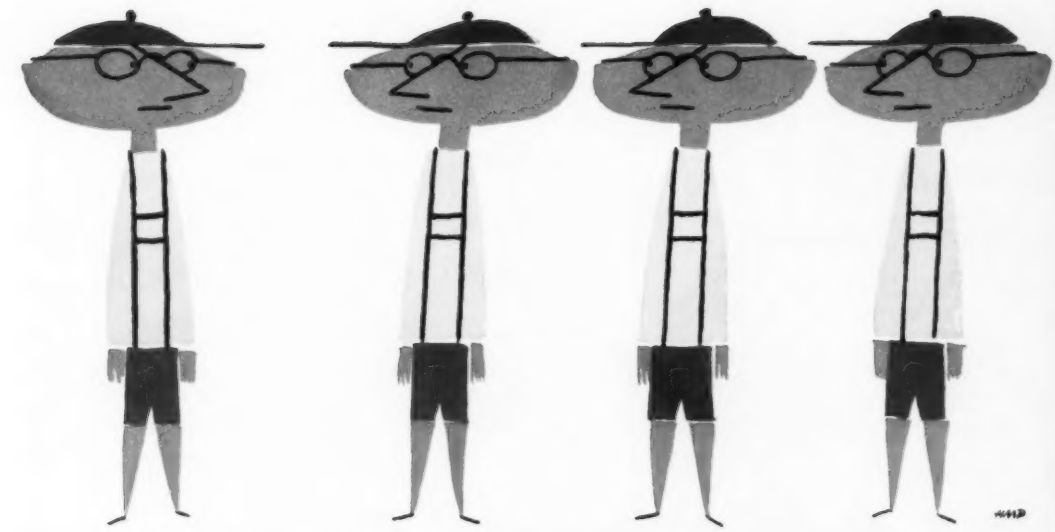
REQUEST "MODEL G BROCHURE."

ALLEN COMPANY, INC., NEW BEDFORD, MASS., U.S.A.

ALLEN MODEL "G"

World's Most Advanced High Speed Warper

PUTNAM PRODUCTS FOR THE TEXTILE INDUSTRY



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Auxiliary Products

Badische Anilin-and Soda-Fabrik A.G. research has developed the following outstanding dyeing auxiliaries:

- **Basogal P** – completely new approach for leveling vat dyeings.
- **Nekanil AC special** – cationic agent, combining cleansing and leveling properties, especially in acetate and wool dyeing.
- **Uniperol W** – leveling and protective colloid agent for dyeing wool, polyester and polyamide fibers.
- **Uniperol AN** – retarding and leveling assistant for cationic dyestuffs on acrylic fibers.
- **Albigen A** – for leveling and stripping of vat dyeings.
- **Primasol FP** – an entirely new auxiliary for all pigmentation processes.

We will gladly provide technical information and assistance.

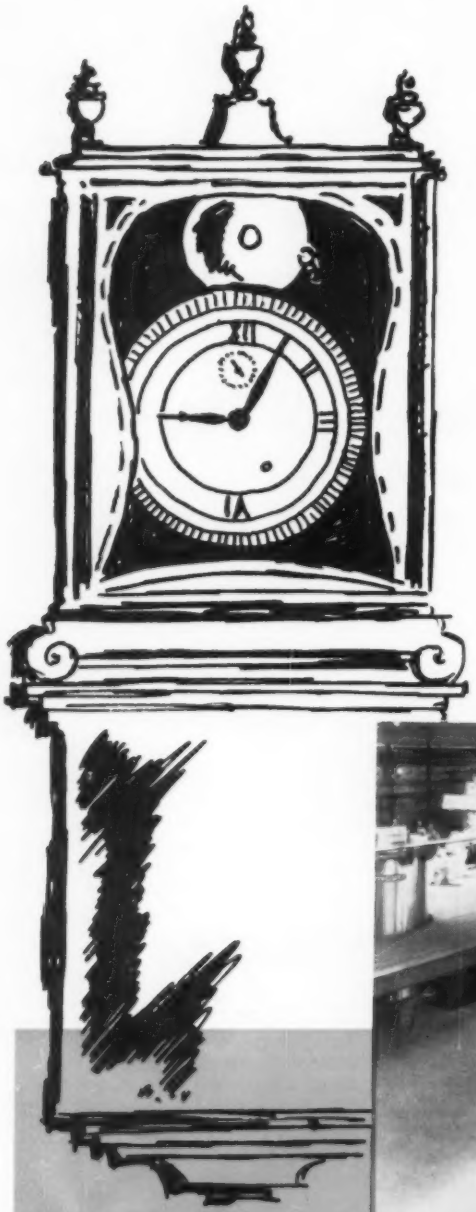
BASF knows how

In Canada contact:
Consolidated Dyestuffs & Chemicals Ltd.
395 Beaumont Avenue
Montreal 15, Quebec

PUTNAM CHEMICAL CORPORATION
BEACON, N.Y. • CHARLOTTE, N.C.

DISTRIBUTORS IN U.S.A. FOR *Badische Anilin- & Soda-Fabrik A.G.*
LUDWIGSHAFEN A. RHEIN, WEST GERMANY

WAREHOUSES: Providence, R. I. • Paterson, N. J. • Philadelphia, Pa. • Greensboro, N. C. • Charlotte, N. C. • Greenville, S. C. • Chicago, Ill. • Los Angeles, Calif.



WALL CLOCK *ca* 1770-1780
SIMON WILLARD, Roxbury, Mass.

IT'S TIME TO CUT COSTS

FOR THE MOST EFFICIENT DYEING and BLEACHING EQUIPMENT, INSIST ON

Morton System

THE FINEST MONEY CAN BUY

MORTON SYSTEM PACKAGE DYEING MACHINES

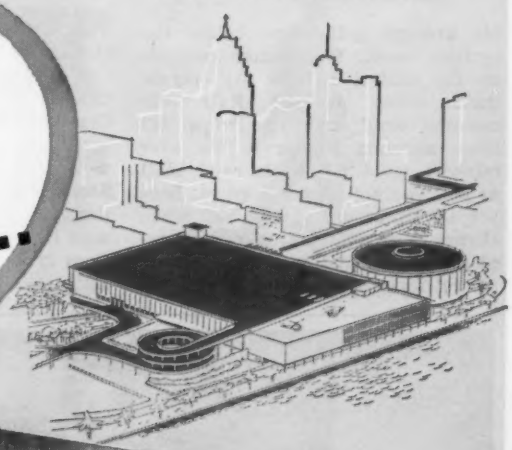
Do not compromise on bleaching, dyeing and drying equipment. Insist on Rugged Morton System Machinery . . . the finest money can buy. Built to ASME code specifications.

MORTON MACHINE WORKS, Inc.

COLUMBUS, GEORGIA, U.S.A.

Manufacturers of the MORTON SYSTEM Machinery for Dyeing and Bleaching of: Beams ● Packages ● Stock Piece Tops ● Valves ● Pumps ● Beam and Package Extractors and Dryers ● Dye Beams, All Makes and Designs ● Dye Tubes ● Dye Spindles ● Tube Spacers ● Custom Built Tanks to Customer's Specifications

11 SQUARE D SUBSTATIONS SERVE COBO HALL...



World's largest exhibition building, COBO HALL occupies 10 acres of Detroit's Civic Center

...capable of supplying 22,000 KVA of continuous power!

Square D Field Engineer Don Selby *(right)* and Mr. Gil Brandt, Project Electrical Engineer of Giffels and Rossetti, architect for COBO HALL, examining one of the drawout circuit breakers in the low voltage secondary portion of a Square D 2000 KVA double-ended unit substation equipped with nitrogen-filled transformers

Easy, fast installation was a prime objective when eleven Square D unit substations went into COBO HALL. The various sections of each substation were completely coordinated at the factory. Reconnection of those sections at the job site required a minimum of time and labor.

Design leadership is very much in evidence in Square D's broad line of unit substations. We suggest a three-point comparison to prove the point—ease of installation, minimum maintenance, maximum safety for both equipment and personnel.

AMONG OTHER SQUARE D EQUIPMENT IN COBO HALL

31 Control Centers
28 Switchboards
450 Panelboards
75 Contactor Panels
1 Dimmer Board
10 Dimmer Panels
16 NEMA 4-Circuit Interrupters
120 Spotlight Control Panels
19,000 feet of Lay-In Duct

SQUARE D COMPANY

wherever electricity is distributed and controlled

SHORTS & REMNANTS

(from page 16)

his average golf score below the century mark. Pushbutton switches on the control console (A) operate these seven devices: Rake (B) smooths sand trap; periscope (C) rises, allowing Homer to see over bunker; spout (D) emits sand blast as ball is slyly tossed to green; hopper (E) drops out a new ball when Homer blows a shot; claw (F) replaces divots; and mechanical ferret (G) retrieves balls from gopher holes.

Data on Fabric Defects

"I am interested in acquiring a book on fabric defects, their causes and how to eliminate them."

JACK E. HAMRICK
The Hartsville Cotton Mill
Hartsville, S. C.

We recommend J. B. Goldberg's "Fabric Defects," published by McGraw-Hill Book Co.

► We are indebted to the **Wall Street Journal** for this bit of incidental information: Union Carbide used its own Dynel fiber for most offices in its new Manhattan building. But some top executives got wool.

Ad for Ad Man

This is **George T. Metcalf,** chairman of the board of George T. Metcalf Co. and unofficial dean of the advertising fraternity in Rhode Island, who recently received the Silver Medal Award as Ad Man of the Year from the Advertising Club of the Providence Chamber of Commerce:

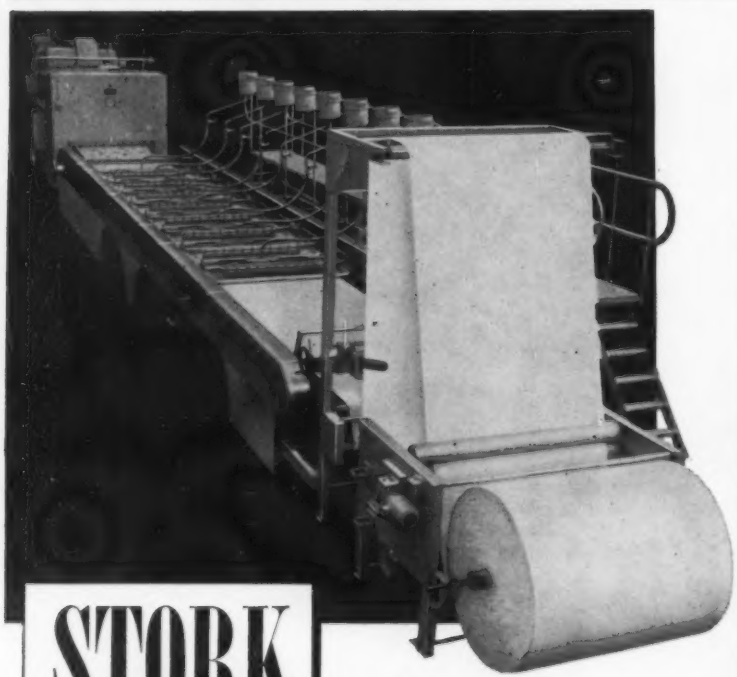
Mr. Metcalf has been placing textile advertising about as long as anybody, since 1922, when he joined Franklin Process Co. as ad manager; and has operated his own agency since 1932.

Ad for Ad Man, No. 2

While we're at it we might as well show you another ad man, and at the same time wind up our coverage of the American Textile Machinery Exhibition:

That's **John Freed,** ad manager for Leesona Corp., with **Sandra Lee Jennings,** Maid of Cotton, taken in Atlantic City during her visit to ATME. Incidentally, while we were in Atlantic City John let us in on the secret of the meaning of the name "Saaba" (the textured yarn for which Leesona is the licensor), but we promised not to tell.

► And next month comes our special preview of the Greenville Show, and we'll see you in Greenville Oct. 3-7.



STORK

Automatic Screen Printing Ranges

- Utmost Accuracy!
- Speeds to 900 Yards per Hour!
- Greatest Changeover Flexibility
- Only Minutes to Alter Repeat Widths!

Details and Reference Lists on Request

Call or Write Today!

COSA CORPORATION

Chrysler Building, 17 N. Y. C.
YUkon 6-9696
1411 Johnston Bldg., Charlotte 2, N. C.
FRanklin 5-1677

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HAVE YOU LOOKED INTO THE

- **Uniform Extraction**
- **Uniform Penetration**
- **Long Life — measured in years**

MICROROK® combines the best properties of metal rolls with the best properties of rubber rolls. It combines hardness and smooth finish with the resiliency of rubber. It gives outstanding life between grinds, thus reduces your maintenance costs. Microscopic depressions in the surface, which looks mirror-like, aid in gripping fabric and preventing slippage.

For the MICROROK catalog page containing complete technical information, see your S-W Sales Engineer.

STOWE-WOODWARD, INC.

Ask the man from S-W . . .

. . . about the excellent wear-resistance qualities of **MICROROK** covers. Heat resistance this cover offers, too, up to 180°F. Padder, Mangle, Washer, and Carbonizer Rolls give long service life when their covers are **MICROROK.**

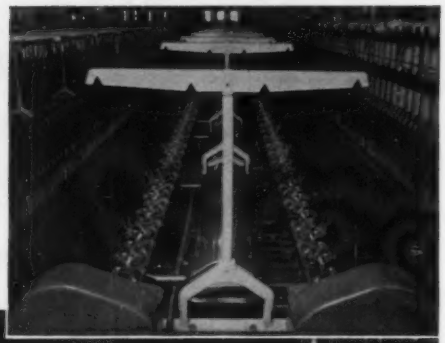
Literally hundreds of **MICROROK** Rolls are proving daily that they are the most versatile hard rolls in use today. This and other factors mean cover longevity which you may not be getting. Ask your S-W man for the facts.

STOWE-WOODWARD, INC.
Newton Upper Falls, Mass.
Neenah, Wisconsin
Griffin, Georgia

on the West Coast

HUNTINGTON RUBBER MILLS, INC.
Seattle, Washington
Portland, Oregon
Port Coquitlam, British Columbia, Canada

Why the stamped steel cross-arms are notched



on the Bahnson Open-Aire Creel

Fundamental in Open-Aire Creel's special stamped steel construction for extra strength are the deep drawn steel cross-arms notched for maximum lateral rigidity. Longitudinal runners of stamped steel or extruded aluminum are fastened in the notches on the cross arms, thus fewer lint catching areas are exposed resulting in cleaner creel surfaces.

You get these additional benefits:

- baked enamel steel surfaces for less lint accumulation and for eliminating etching and corrosion
- slotted bobbin holder rails for flexible package positioning
- weight wire positioners to keep weights in correct operating position
- custom designed creel arrangements to suit your spinning requirements — 4/0, 4/2, 6/0, 6/2.

For consultation on your creel needs, clip coupon to letterhead and mail today.

Name_____

Bahnson

AIR-O-MATION

THE BAHNSON COMPANY • WINSTON-SALEM, N. C.

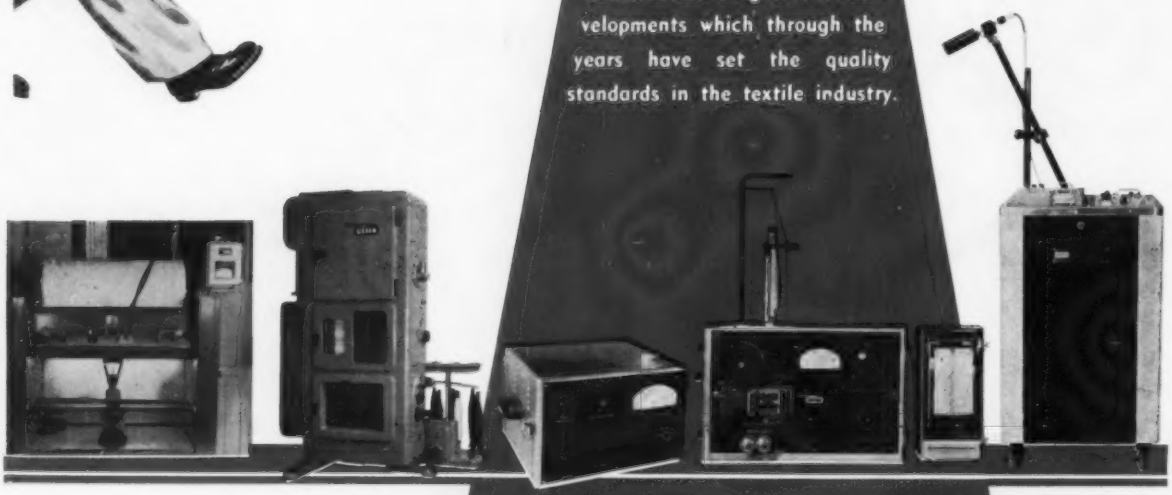
Booth 830-831, Greenville Textile Show

Penick
P&F
HAVE GUM
WILL TRAVEL
Penford Gums are extremely versatile hydroxyethyl ether starches . . . well qualified in both fluid and dried film states as Textile Finishing Gums. They contain an optimum degree of hydroxyethyl ether.
On color fabrics, their sharp clarity allows production of superbly crisp finishes without graying or dulling.
Penford Gums are highly reactive with all thermosetting resins. They provide a permanent built hand which is durable to laundering, will not yellow; and they minimize loss of strength associated with dimensionally-stable crease resistant finishes
For Special Jobs—
wire Technical Service
Penick & Ford, Atlanta
HAVE GUM WILL TRAVEL
Penford Gums
Leaders in Epoxy Starches
U.S. Pat. Nos. 2,516,632; 2,516,633; 2,516,634.
PENICK & FORD, LTD.
INCORPORATED
1531 MARIETTA BLVD., ATLANTA, GA.

Manufacturer of Douglas Pearl • Crown Thin Boiling • Douglas Dextrines • Clearsol Gums for the Textile Industry

THE RED CARPET

We have a royal red carpet welcome ready for you in Booth 469 at the Southern Textile Exposition. New products such as SPECTOMATIC (shown in action for the first time) will join the many other outstanding USTER developments which through the years have set the quality standards in the textile industry.



Continuous quality control has become an essential part of the daily manufacturing process in today's modern textile mill. Because of this, most mills now maintain complete testing laboratories. They consider USTER equipment an integral part of their day to day operation, a fact borne out by their quality production.

© USTER CORP. 1960

IS OUT AT THE USTER BOOTH 469

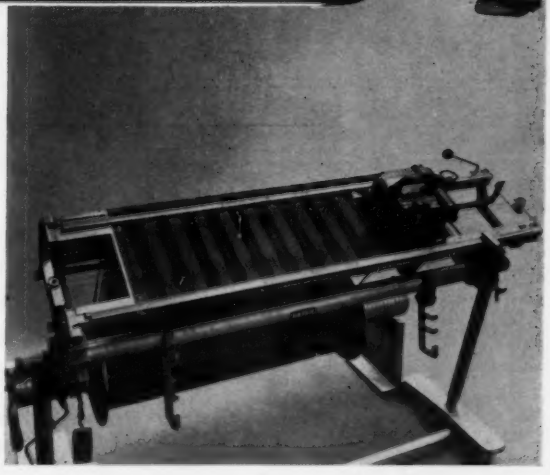
See the first public showing in operation—on two winders!

SPECTOMATIC

- Can be precisely controlled to remove *only* the slubs *you* want removed.
- Analyzes whether a knot would be worse than a defect and acts accordingly.
- Removes up to 65% more slubs than existing mechanical slub catchers.
- Mounts directly on winder—is not affected by vibration.
- Operates on low voltage — not affected by power fluctuations.
- Completely transistorized — no warm-up required.

USTER *matic* *should definitely be on your "must see" list!*

- Ties 550 to 650 knots per minute.
- Actually cuts warp tying time in half.
- USTERmatic is flexible, it ties from a flat sheet, lease or any combination.
- A specially designed warp tying frame drastically cuts preparation time.
- Automatically stops on double ends or flats.



Be sure to have your company personnel visit Booth 469 and report on the latest USTER equipment. A complete staff of technicians and engineers will be on hand to discuss recent advances in manufacturing standards brought about by USTER products — made *better* to serve you *better*.

USTER CORPORATION • CHARLOTTE 8, NORTH CAROLINA

SALES OFFICES: Charlotte, N. C. Canadian Sales Offices: Hugh Williams & Co., 27 Wellington St. East, Toronto 1, Ontario

FOR BETTER MILL PERFORMANCE AND YARN QUALITY, BLEND COTTON BY DENSITY THROUGH WEIGH PANS

NOW AVAILABLE

An economical CONVERSION of existing opening hoppers to weighing feeders by the addition of a scale mechanism.

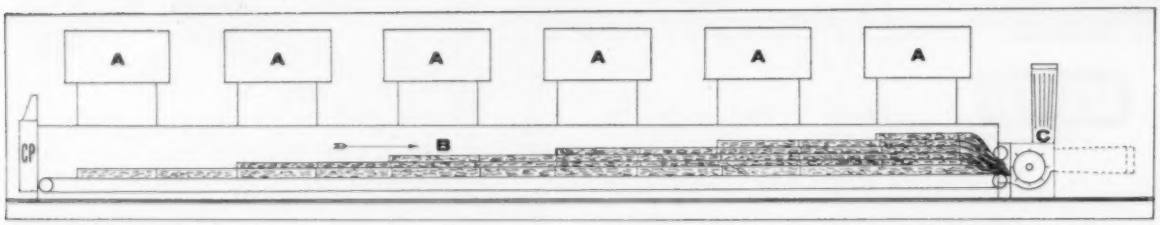
To be ranged with the standard sandwiching SYNCROVEYOR (control panel assembly) and plucking cylinder (the SYNCROBLENDER).

OBJECT . . .

To improve process uniformity and efficiency throughout any Blend process by the use of this PRODUCTION INSTRUMENT.

HOW IT IS DONE

Fiber properties can vary widely. Ultimately, the basic yarn evenness requirement is to place *the same number of fibers of each density* (represented by the laydown) in each inch.

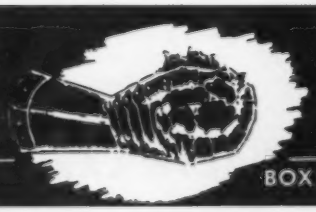


Therefore, consider it "fact" that stock representation per yard of picker lap is *from one bale per hopper* and select and lay down bales accordingly.

Meter consistently predetermined increments of ounces . . of each density (fineness) designation in short term control intervals of seconds. *Handle reworkable waste through one weigh pan.*

No additional floor space, connected horsepower, or labor required for SYNCROMATIC SYSTEM.

Write or contact us for further and more complete information.
U. S. Sales Agents: PARROTT and BALLENTINE, Inc., 3400 Augusta Road, Greenville, S. C.



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Picker Overhauling Is Simple When You Depend On . . .

Aldrich Repair Service

We furnish skilled men for reworking pickers, and can deliver to these men any needed parts within 24 hours in most southern states, and within 48 hours to almost any cotton mill in the United States. This makes thorough overhauling a simple matter. Anything needed for a good job can be had at once, while the machine is down for repairs.

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We manufacture and install complete blending, opening, and picking systems for cotton and synthetics, and cleaning systems for cotton.

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SOLUTINT — Widest selection of POWER-MATCHED colors.

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RESYN 3600 is suggested for industrial fabrics, work clothing fabrics, denims, filter clothes, military fabrics, awnings and tarpaulins, etc. It is also recommended as a binder for non-woven fabrics.

Experimental lots of RESYN 3600 are now available. A 14 million lb. plant will be on stream this fall. Write for information.

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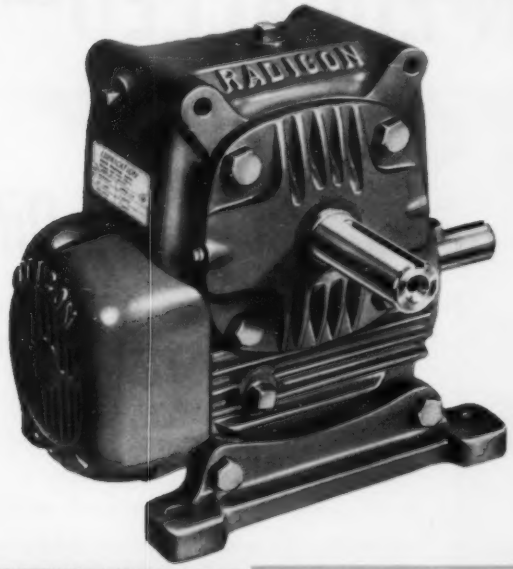

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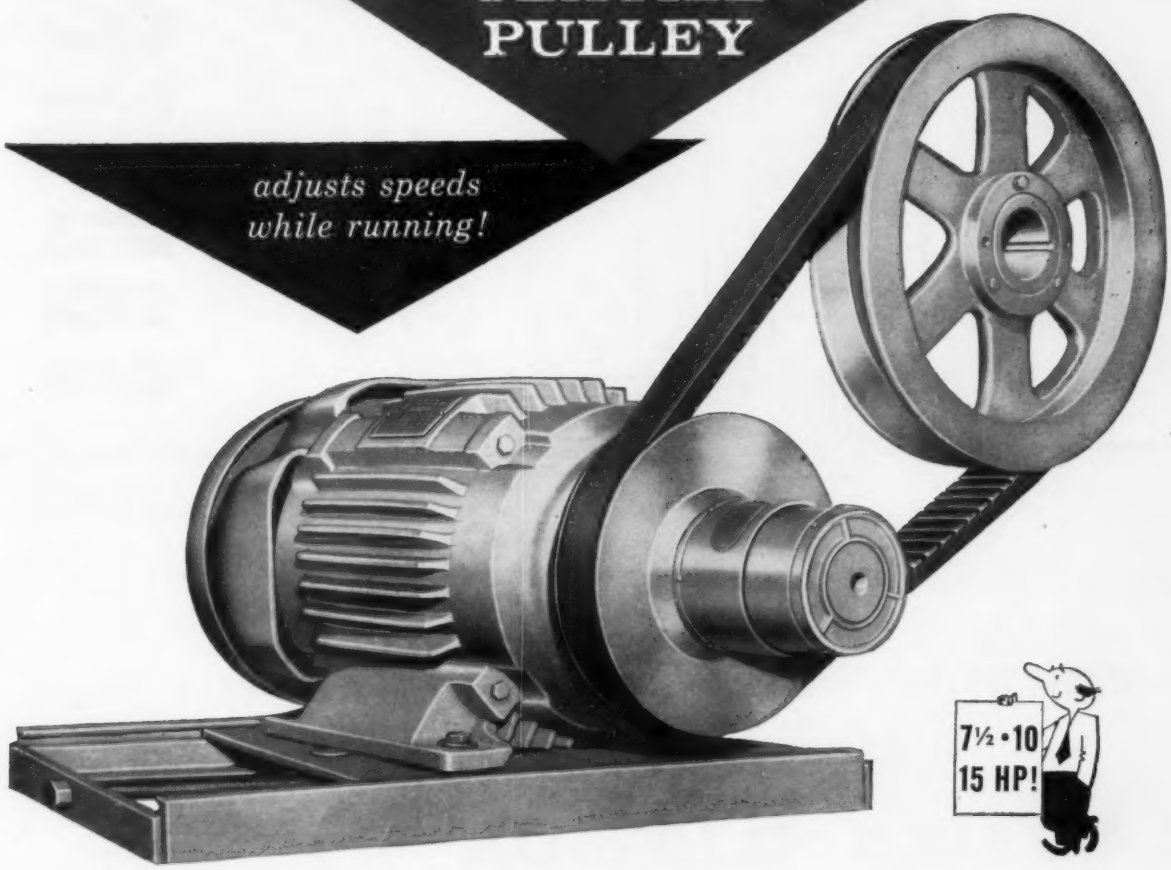

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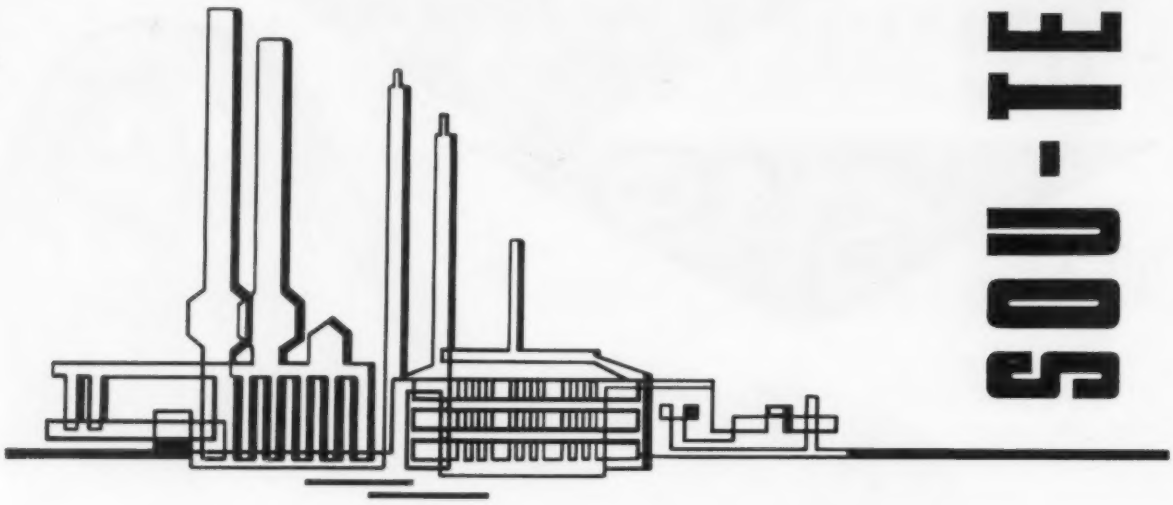

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"Buffalo" Axial Flow Fans provide extremely quiet and efficient performance. This inherent efficiency is further improved by the "Buffalo" Vaneaxial outlet guide vanes. These carefully engineered vanes re-direct the swirling air at the fan outlet, converting it into increased forward thrust.

These sturdy, reliable fans are light in weight, permitting easy installation. Except for the largest models, no structural support or heavy foundation are required. "Buffalo" Axials can be installed as a section of the duct or stack in hood and other roof exhaust systems.

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'Buffalo' Air Handling Equipment to move, heat, cool, dehumidify and clean air and other gases.

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Harshaw Zinc Nitrate Flake is especially suited for polymerizing resins currently being used for wrinkle-free and wash-and-wear fabrics.

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Look alikes. Z. K. Kelly, Spinning Foreman, holds three clean spindles. Yet, only the left spindle is a new one. The center spindle is four years old, and the spindle on the right is five years old. Gulfspin keeps them looking new.

At Harriet & Henderson Cotton Mills, spindles clean after

GULF MAKES THINGS

For the past five years, Gulfspin lubricating oil has been used on all spindles in Harriet & Henderson's five cotton mills. "After spot-checking the spindles," says Mr. Z. K. Kelly, Spinning Foreman, Henderson Mill, Henderson, North Carolina, "we saw no reason to remove them. They were still clean after five years. So we decided to let them run and make periodic spot checks.

"We've seen what happens when spindles are lubricated poorly," says Mr. Kelly. "They turn black and corrode. And gum forms on them. This causes spindle drag, a lack of uniform twist-per-inch, and results in more ends down per thousand spindles. In short, it hurts product quality. But with Gulfspin on the job, we never worry about poor spindle lubrication."

Mr. W. W. Bishop also had a lubrication problem. As Weaving Foreman in the Henderson Mill, he supervises

Monthly oil check. This spindle lube cart is loaded with Gulfspin lubricating oil. Foreman T. D. Peck uses it to check oil level every month in plain bearing spindles and every year in ball bearing spindles.

Roving frames. Gulfcrown Grease is used to lubricate bobbin and spindle drive gears. This lithium base, general purpose lubricant has helped Harriet & Henderson Cotton Mills reduce drive shaft replacements.

Checking a loom. Dan C. Austin, Gulf Sales Engineer, left, and W. W. Bishop, Weaving Foreman, talk over the performance of Gulfcrown Grease E.P. It's used on main drive cam surfaces—and it stays.

Two old pros. J. D. Cooper, right, President and General Manager, Harriet & Henderson Cotton Mills, Inc., and Gen. J. W. Jenkins, Gulf Distributor. "J. D." knows that he can get any Gulf lubricant in 30 minutes from the General's bulk plant.

5 years of lubrication with Gulfspin® oil

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production on 448 looms. "I had trouble getting grease to stay on main drive cam surfaces. But, then I started to lubricate them twice weekly with Gulfcrown® Grease E.P. Now, there's always grease on the cam surfaces."

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SINGER* diversifies into tufting machine manufacture

–acquires COBBLE BROTHERS

Cobble Brothers Machinery Co., Inc., and Cobble Brothers Sales Co., Inc., Chattanooga, Tenn., major manufacturers and distributors of tufting machines and carpet finishing equipment have been acquired by The Singer Manufacturing Company. Acquisition includes Cobble subsidiaries Super Tufter Machinery Co., of Fort Oglethorpe, Ga., Gowin Machinery Company of Dalton, Ga., Southern Machine Company of Chattanooga, and Cobble Brothers Machinery Co., Ltd., of Blackburn, Lancashire, England. As Singer-Cobble, Inc., the new firm will operate as a subsidiary of The Singer Manufacturing Company under the direction of Singer's Special Products Division.

MANAGEMENT. Lewis Card who has served as Cobble's Treasurer and General Manager for a number of years, will continue active direction of the company.

HEADQUARTERS. Continue unchanged: Riverside Drive, Chattanooga, Tenn. 2881

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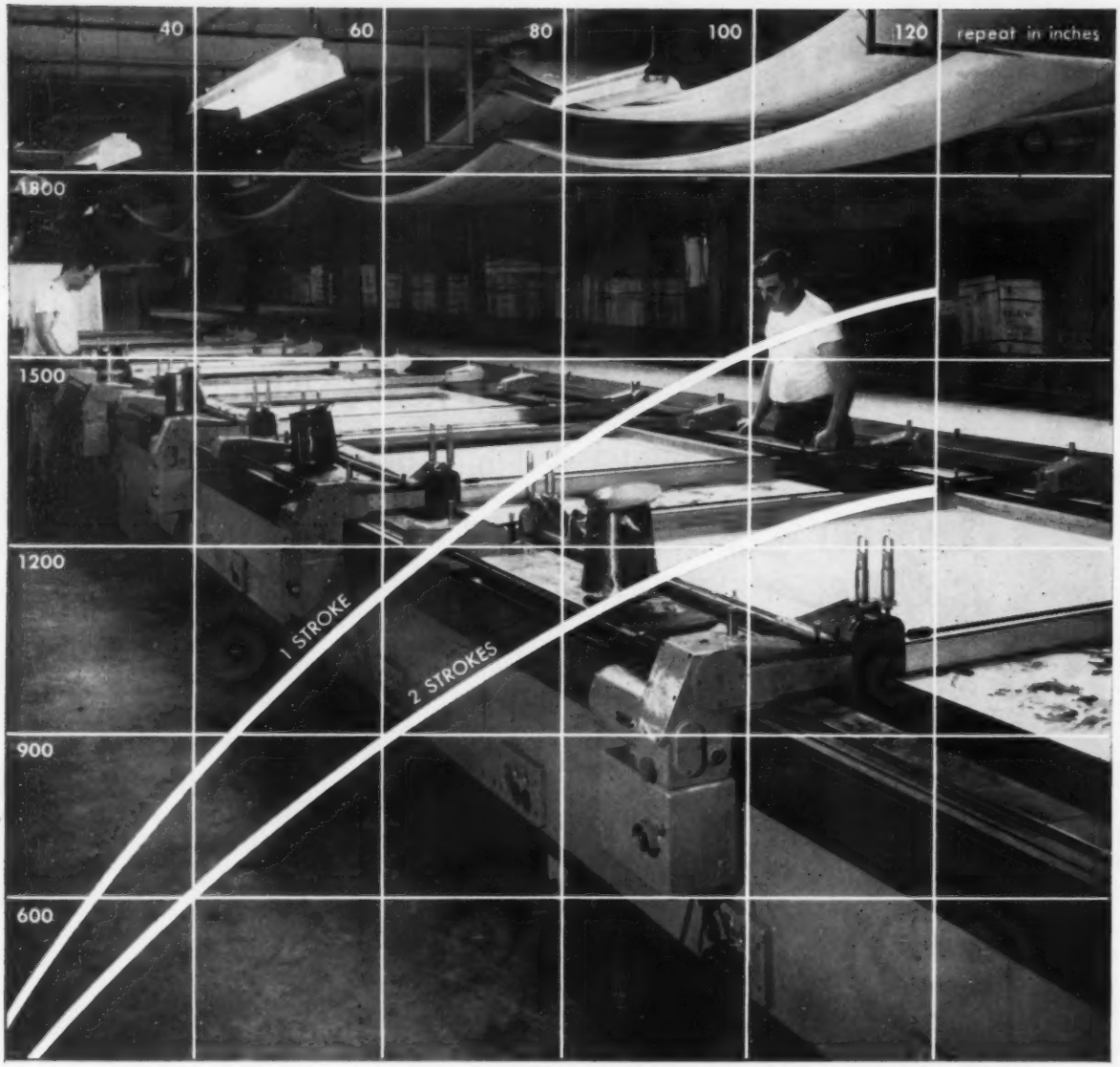

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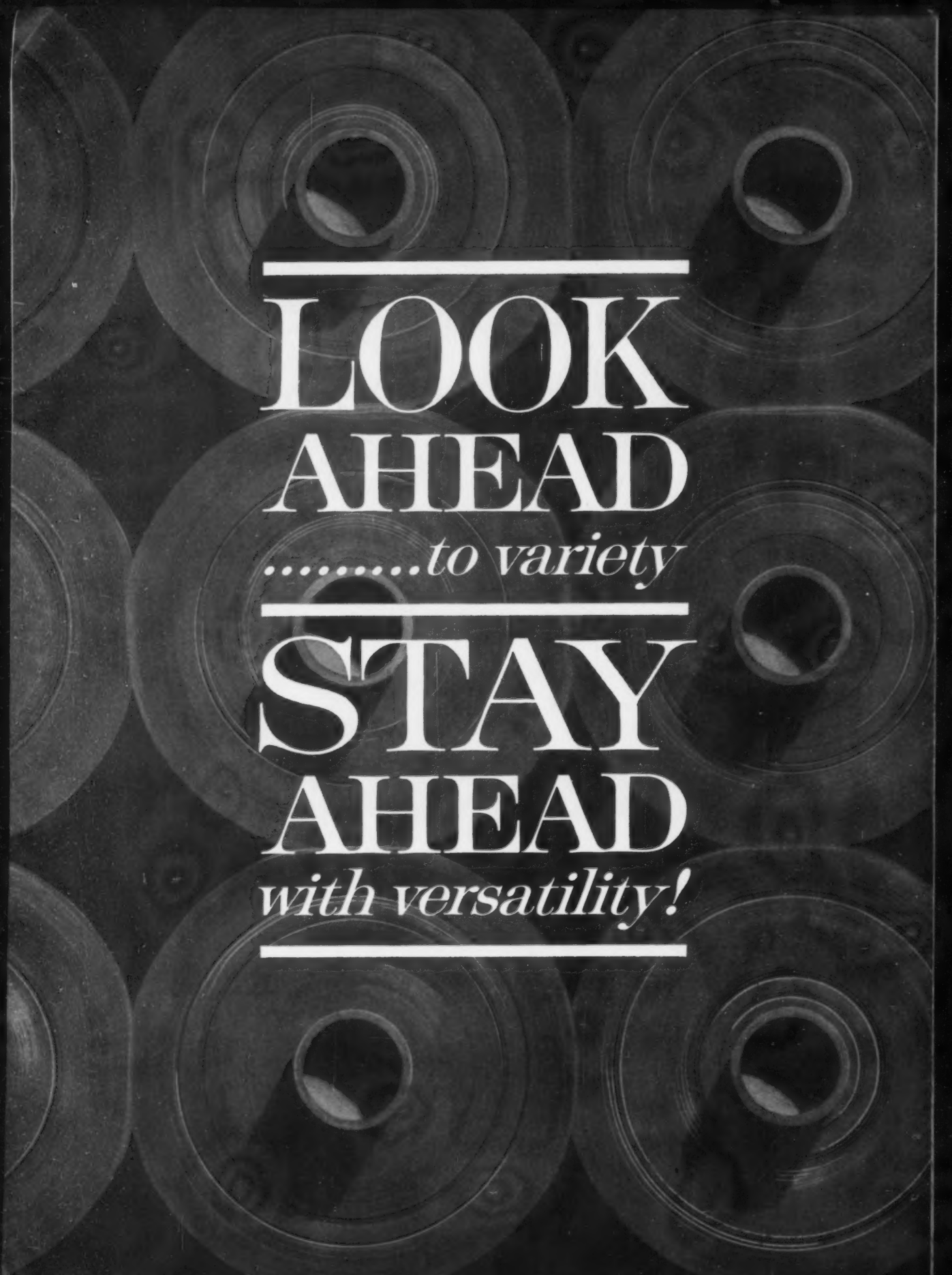
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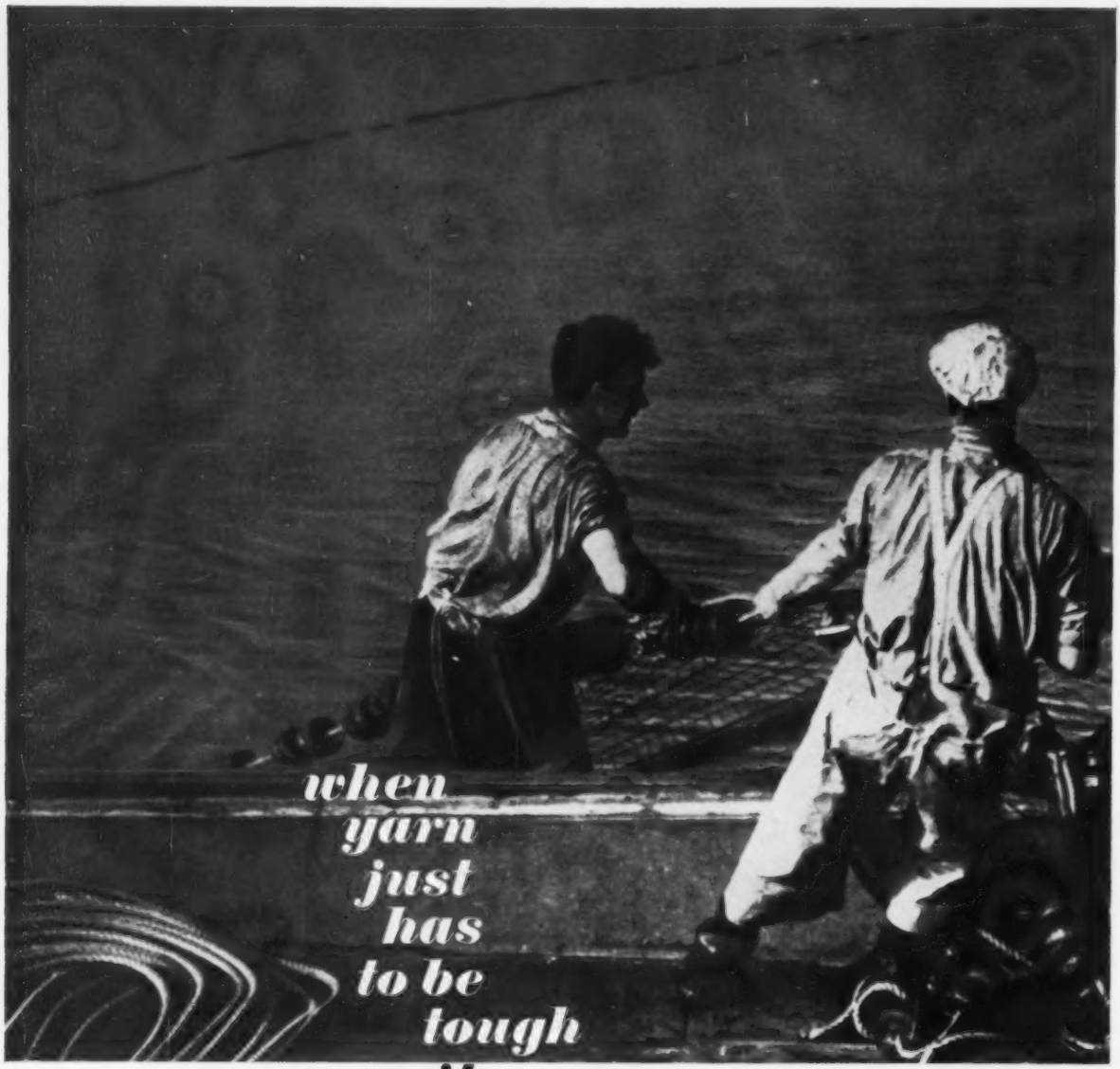
Visit Leesona at Greenville Southern Textile Exposition
Booth 810 — October 3-7



it better be

Golden Caprolan Nylon

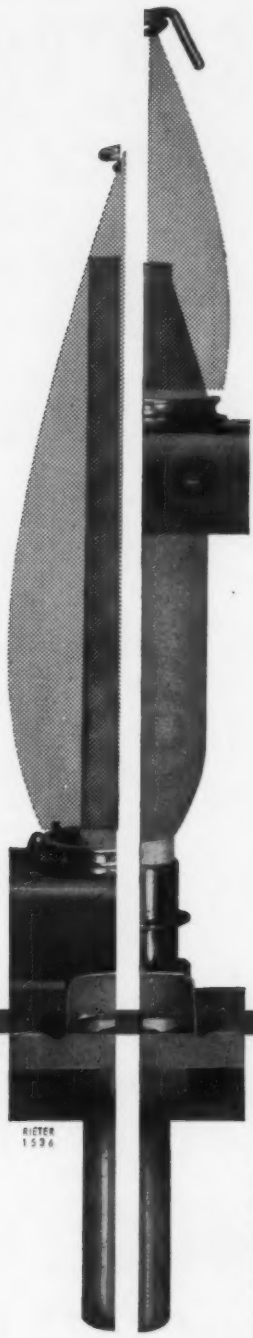
It takes a tough yarn to assure a net profit — and tough is the word for high-tenacity Golden Caprolan® by Allied Chemical. But Golden Caprolan is more than just a tough yarn. It is a remarkably versatile yarn that offers a unique combination of superior performance qualities including unsurpassed resistance to abrasion, excellent rubber adhesion, greater resistance to flex fatigue, and troughing qualities not obtained from other yarns. Golden Caprolan established a new criterion for heat stability in nylon tire yarn and a new standard of strength for heavy-duty marine ropes. Golden Caprolan is performing superbly in conveyor belts, tarpaulin fabrics, high-strength industrial webbings, and other applications where heavy-duty performance is essential. If you have a tough job, we have the tough yarn for it.

Our technical service, end-use development and fiber application staffs are ready to help.

GOLDEN caprolan
NYLON OF THE 60's

Fiber Marketing Dept., 261 Madison Ave., New York 16, N. Y.

G 4



Fixed spindle rail
= irregular balloon,
uneven yarn tension

Movable spindle rail
= practically constant
balloon, compensated
yarn tension

Advantages of Rieter's spinning frame G 4

Rieter's ring spinning frame G 4 is the most economical solution for large cops and the whole count range in cotton yarn spinning. The outstanding feature of this machine is the movable spindle rail, which ensures a practically constant balloon during the formation of the cop and thereby a compensated yarn tension, and permits maximum operating speeds. The automatic underwinding and stopping device simplifies operation and enables cops to be produced with uniform yarn length. The guide saddle drafting arrangement with double aprons and pneumatic weighting of the ball-bearing top rollers supplies better yarn with higher drafts. The pneumatic weighting system has the advantage that the pressure can be adapted quickly to all requirements which are encountered. On request the fluted rollers are also supplied with ball bearings.
Rieter's ring spinning frame G 4 meets the highest requirements and greatly contributes towards improving the productivity and thereby the competitive ability of a spinning mill.

Please ask for our special pamphlet G 4.

Rieter

American Rieter Company, Inc. **West Caldwell, N. J.**

Service Office: Greenville, S. C., Southern Agency: Belton C. Plowden Co., Griffin, Ga.

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TAPEnology licks tricky build-up... cuts downtime, saves dollars!

Now, by spirally wrapping "SCOTCH" Brand Plastic Film Tape No. 549* around your pot-eyes, carrying rolls and drying cans, you can practically stop the build-up of sizing agents, lint and other encrusted dirt in your mill. Result: drastic reductions in downtime for clean-up; decreased output of second quality goods due to soiling; faster production; surer inspection.

Tape No. 549 provides a surface to which practically nothing can adhere. Any minor dirt transfer that does occur can be quickly and easily removed with a damp swab . . . no caustics, heavy solvents or scraping needed! It sticks-at-a-touch; can be applied by anyone right on the production line in just a few minutes.

Your 3M Representative will be glad to advise or assist you in finding opportunities for No. 549 tape to cut costs in your mill. Ask your nearest "SCOTCH" Brand Tape Distributor for details, or write: 3M Co., 900 Bush Avenue, St. Paul 6, Minn., Dept. IAR-90.

**Made from DuPont's TFE-fluorocarbon resin.*

When tape costs so little, why take less than "SCOTCH" Brand?

"SCOTCH" is a registered trademark for the pressure-sensitive adhesive tapes of 3M Co., St. Paul 6, Minn. Export: 99 Park Ave., New York 16. Canada: London, Ontario.

MINNESOTA MINING AND MANUFACTURING COMPANY

. . . WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

With Dixon's all-new CAVALLA-ROTH* DRAFTING

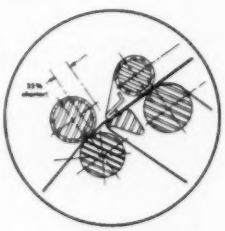
*Pat. Applied for.

. . . the pay-off is in the package!

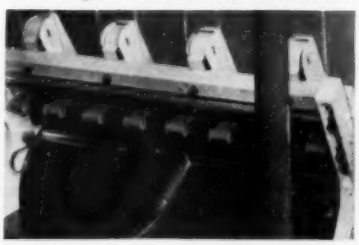
Cavalla-Roth out-features them all. Into this advanced spinning drafting changeover, Dixon engineers have built advantages not obtainable even on the newest spinning frames. And each of these design firsts is aimed at giving you one thing: top quality yarn at lowest cost per pound.

Cavalla-Roth gives full fiber control —

Specially shaped apron nose bar and tensioned lower apron reduce by 25% the uncontrolled space between middle and front rolls. Here, at the critical point in the drafting process, Dixon's unique system controls the fibers, assuring new strength and evenness in the yarn you produce.



Cavalla-Roth sets a new high in LOW MAINTENANCE —



This is the only NO OIL changeover available. All bearings — both for top rolls and bottom steel rolls — are either of Dixon's exclusive "lube-less" RULON or of the "life-lubed" anti-friction type. Cavalla-Roth's clean Tension Weighting system cuts out dozens of lint-catching surfaces . . . there are absolutely no springs, weights, stirrups or levers below the steel rolls to collect lint and up cleaning costs. And of course, improved fiber control reduces the problems and costs of ends down. Actual mill experience proves this new system is a real maintenance miser.

Cavalla-Roth Weighting — PERMANENT YET INFINITELY VARIABLE . . . ACCURATELY MEASURABLE

The new Tension Weighting system permits positive and permanent setting of top roll weight within a 100 lb. range . . . and most important, allows for accurate measurement of this setting with Dixon's Tension Meter. There are no levers or springs to build up friction, lose adjustment, and vary weighting. The C-R top arm (automatic cam latching) simplifies spinners supervision by making possible roll examination or service without time consuming weight lifting or hand latching. Roll spreads can be adjusted for drafting up to 1 9/16" fibers in two zone drafting and up to 3½" fibers in single zone drafting.

Cavalla-Roth gives APPLICATION FLEXIBILITY

Cavalla-Roth drafting can be tailored to meet your needs: 1) as a complete unit from roller beam up on 60°, 45° or 30° roll stands, 2) as a changeover, using the mill's middle and back steel rolls, 3) as a top roll changeover, using the mill's stands and steel rolls, or 4) as Cavalla-Roth P.C.O. . . . a partial changeover providing the advantages of better fiber control at a minimum cost per spindle.

For photos, engineering specifications, and costs of Cavalla-Roth, write:

Dixon Corporation • Bristol, Rhode Island

Plants in Bristol, R. I. and Charlotte, N. C.
Sales and Service representatives throughout the Industry

See Cavalla-Roth at Booth 850 in the Greenville Show

Dixon

ENGINEERED SPINNING CHANGEOVERS SINCE 1876

ANTHRASOL / INDIGOSOL

The most complete range of LEUCO VAT ESTERS available to the textile industry

- Same outstanding fastness properties as parent vat dyes.
- Excellent levelness and freedom from specking in light and medium shades.
- Applicable to blends of polyester and cotton or rayon in piece goods or yarn form.
- Suitable for dyeing at all stages of processing.
- Excellent for printing on cottons, rayons and certain blended fabrics.
- More economical than vat dyes in light shades.

INDIGOSOL is a registered trademark of DURAND & HUGUENIN, S.A., Basle, Switzerland

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CHARLOTTE • LOS ANGELES • PHILADELPHIA • WEST WARWICK, R. I.

Reduce loom down-time and Picker replacement cost with all new . . .

DENMAN Pioneer PICKERS

Performance tests prove these pickers give astonishing wear!

Drop Box Picker
DENMAN® PIONEER
Loop Picker
DENMAN
PIONEER
These products are the culmination of twenty-five years experience in manufacturing loom parts for the textile industry.

DENMAN DROP BOX PICKER

. . . featuring a cured-in oil wick!

This new drop box picker made of high density plastic has a cured-in oil wick as an integral part of the picker. This wick insures cool frictionless sliding on the rod, and the oil vent also serves as an outlet for heat. We have applied for a patent on this feature invented by our engineers.

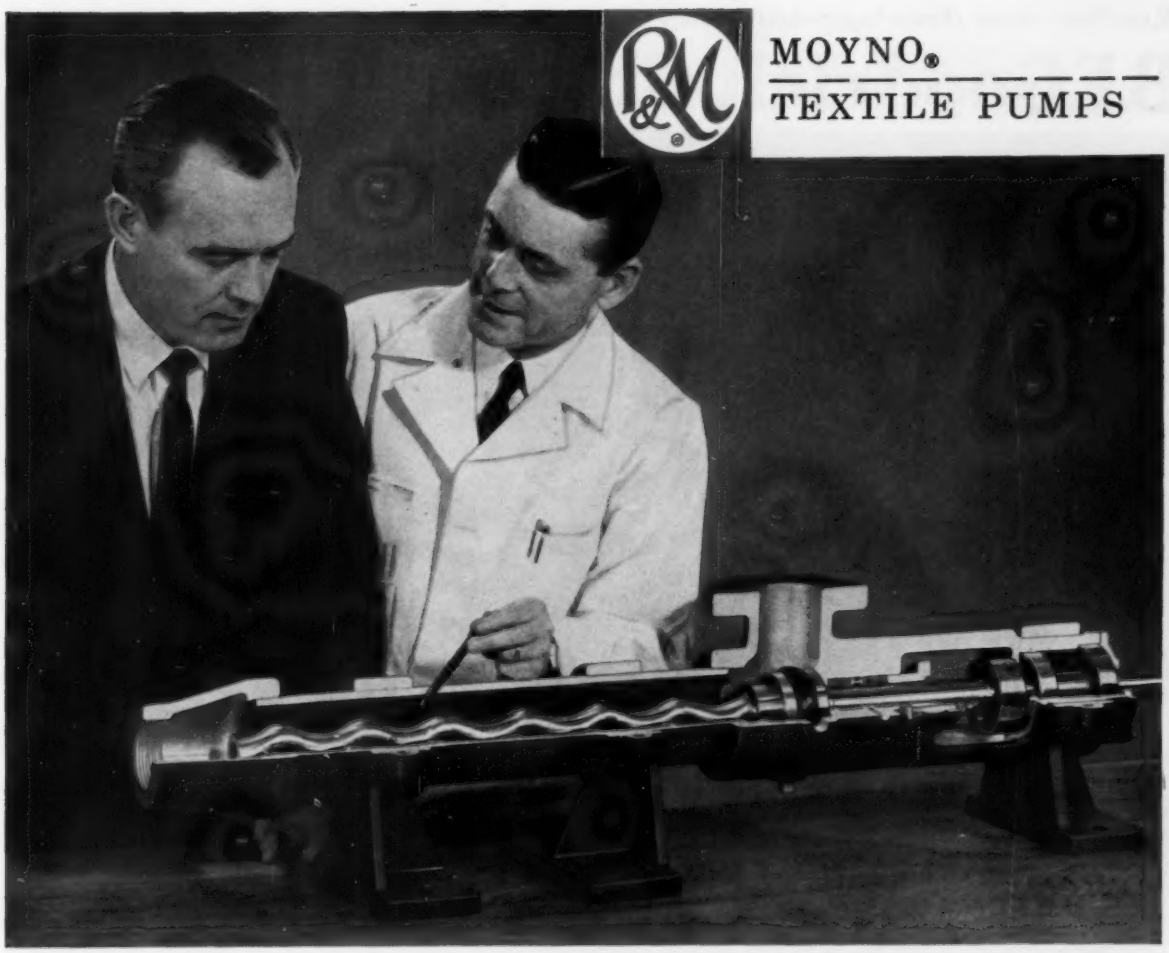
DENMAN LOOP PICKER

New rubber compound assures longer life!

The new light colored loop picker is built from a new white rubber compound developed in our laboratories, and a specially woven fabric made to our specifications. In recent tests this picker has indicated wearing qualities superior to all competitive pickers we have tested — yet, the price is no higher than ordinary rubber and fabric pickers.

For further information write The Denman Textile Rubber Division of The McCandless Corporation, 220 West 24th Street, Charlotte, North Carolina.

The McCandless Corporation
Denman Textile Rubber Manufacturing Division
2828 Second Street • Cuyahoga Falls, Ohio



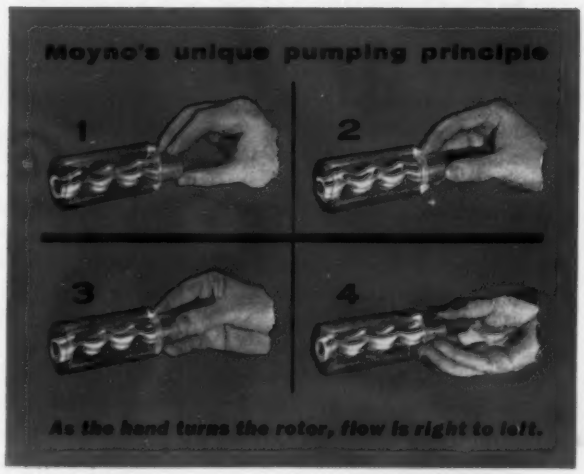
MOYNO®
TEXTILE PUMPS

MOYNOS® Pump Highly Viscous and Corrosive Textile Liquids *Without Excessive Wear!*

MOYNOS pump any textile liquid that can be forced through a pipe! They handle highly viscous materials—thickeners, starch size and non-pourable pastes economically. They pump corrosive liquids—acid solutions, dye and chlorine—without appreciable pump wear. MOYNO can satisfactorily handle caustic alkali solutions and not cause foaming or aerating. In many textile mills, MOYNOS have cut downtime drastically on mercerizing and sizing machines when they replaced rotary pumps which wore quickly and lost capacity and suction characteristics.

This remarkable ability to pump textile troublemakers is explained by MOYNO'S exclusive *"progressing cavity"* principle. As shown at right and in the cutaway model above, a screw-like rotor revolves in a double-threaded stator to form progressing cavities which move all fluids smoothly and evenly through the pump. Corrosion is no problem because both rotor and stator can be made of special resistant materials.

MOYNOS are available in capacities up to 500 gpm; pressures up to 1000 psi. Off-the-shelf replacement parts are always immediately available. For details on how MOYNOS can undoubtedly cut costs and improve liquid handling in your plant, write today for Bulletin 30-TI.



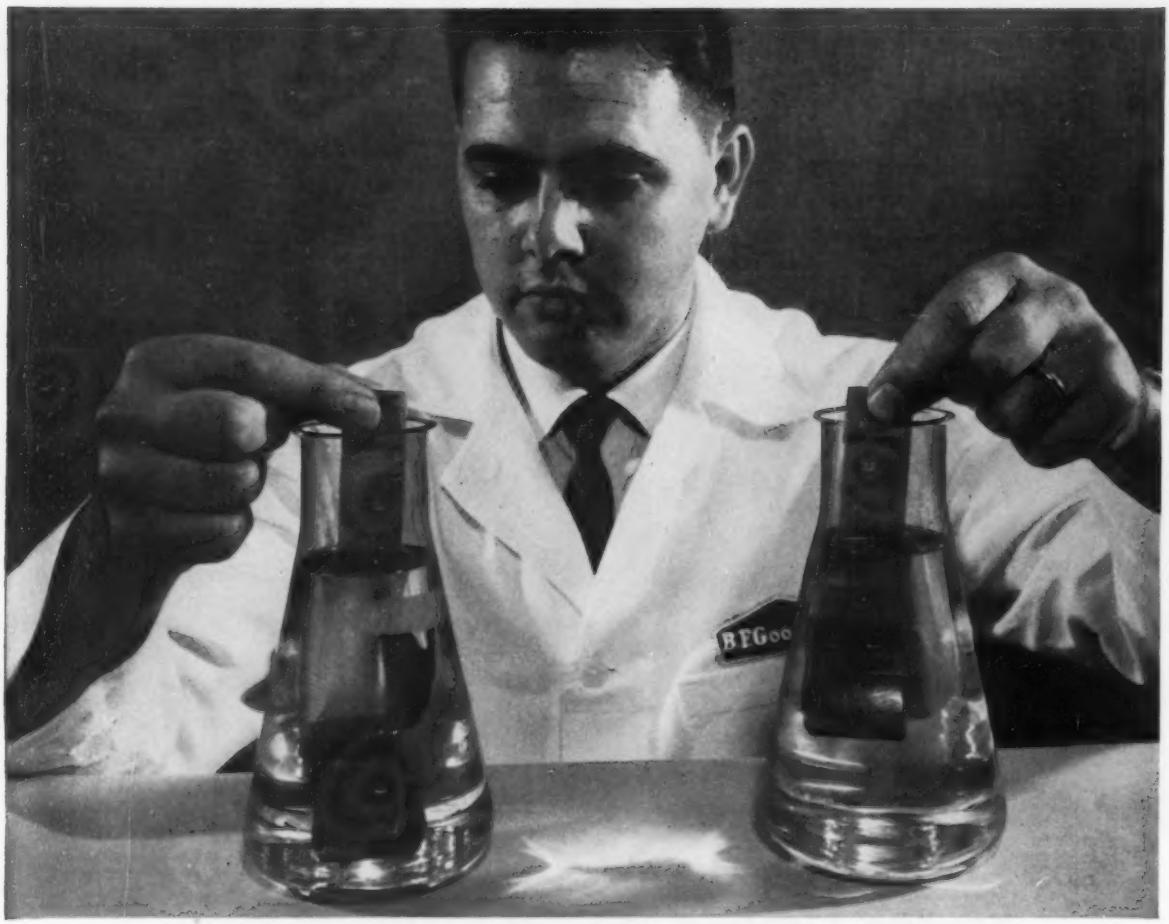
ROBBINS & MYERS, INC.

motors, household fans, Propellair industrial fans, hoists, Moyno industrial pumps

SPRINGFIELD, OHIO · BRANTFORD, ONTARIO

Another new development using

B.F.Goodrich Chemical *raw materials*



Even cleaning solvents can't affect new binder

This new self-curing Hycar acrylic binder eliminates the need for involved compounding to develop solvent resistance and washability. Its excellent behavior is demonstrated above.

The weighted nonwoven at left is made with conventional binder. When immersed in dry cleaning solvent, it failed immediately. The weighted nonwoven at right is made with the new Hycar binder. Immersed in the same solvent for a week, the construction was unchanged.

In addition, the new latex reduces processing costs, increases stability and is colorless.

Complete information about application of new Hycar 2671 is available now. You can learn more about improving nonwovens, upholstery or drapery back coatings, and adhesives with it. It's another example of service you can get to produce better textiles for wider appeal. Write Dept. KA-5, B. F. Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

PRODUCTS FOR TEXTILE IMPROVEMENT

B.F.Goodrich Chemical Company
a division of The B.F.Goodrich Company

B.F.Goodrich

GEON vinyls • HYCAR rubber and latex • GOOD-RITE chemicals and plasticizers

SOFT

SILKY, COLOR-BRIGHT FABRICS ARE FINISHED WITH STANTEX AND STANDAFIN

Are you getting the most from your fabric treatments? STANTEX and STANDAFIN are tops for "wash and wear." They give fabrics softness, silkiness, strength, and sewability. Also, improved resistance to soiling, yellowing, and creasing. You can count on their good effects to last through many washings.

Stantex and Standafin are stable in the treatment mix. They disperse readily and mix well with other finishing materials . . . do not cause discoloration.

No wonder these softeners offer so much! They are backed up by more than 35 years of research and experience. We'll be glad to give you detailed information on each one and all the help you need in formulating treatments. Get in touch with Standard Chemical today!

STANDARD CHEMICAL PRODUCTS, INC.

HOBOKEN, N. J.
CHARLOTTE, N. C.

STANTEX 461

A white paste for use as a top softener or in the resin mix. Preferable for resin finishing where "no soil retention" is a requirement.

STANDAFIN 683

A polyethylene emulsion containing 30% solids. Dissolves readily in water at all temperatures. Has excellent stability in thermosetting resin baths.

STANDAFIN 438

A free-flowing emulsion for resin finishing of cottons and synthetics. Particularly useful for crimped nylon knit goods. They drape better.

STANDAFIN 840

A white emulsion "super softener" . . . outstandingly stable in concentrations having a high content of catalyst, including magnesium chloride.

ACTUAL TESTS* PROVE

Allen-Bradley Standard Duty Push Buttons can be installed

in about half the time!

In accurately timed tests, Allen-Bradley standard duty push buttons required *about half the installation time*—on the average—than each of four other popular makes. This saving in installation time means "dollars" saved on the job. How come only the famous A-B standard duty push button possesses this time and moneysaving advantage? The answer lies in the molded, wrap-around cover—which also contains the contacts. When the cover is removed, the wiring terminals are *out in the open*—ready for wiring—and you have plenty of working space. The two cover screws are captive—they cannot fall out and get lost. And with the contacts in the cover, they are protected against accidental damage and careless wiring. Naturally, these push buttons have double break, silver contacts that never need service attention. There are two concentric knockouts on each end of the base, which are removed from the *outside*—the heavy, pressed steel base will not bend out of shape.

Your local A-B distributor has these Bulletin 800 push buttons *in stock*. Call him today—you'll save time and money on your next job.

*Using recognized standard duty push buttons, installations were made by an experienced electrician under identical conditions. He was not connected with Allen-Bradley Company in any manner.

A-B STANDARD DUTY PUSH BUTTONS
Made as a one-, two-, or three-unit station—with pilot light available. Readily changed for horizontal or vertical mounting. Convertible two- or three-way selector switch supplied with or without pilot light.

ALLEN-BRADLEY

Member of NEMA

Allen-Bradley Co., 788 W. Greenfield Ave., Milwaukee 4, Wis. • In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

QUALITY MOTOR CONTROL

NOW! LOOM BOBBINS

by Stehedco

After years of Research and Development, and proven performance in leading textile mills, Stehedco Precision Bobbins are now available for high speed production of every type of yarn and fabric. Manufactured in our modern air-conditioned Greenville, South Carolina, plant, you have available the facilities, services and production of one of the largest loom bobbin plants in the country.

Manufactured under the same strict Quality Control that has made all Stehedco Products justly famous, these Super Precision Bobbins will guarantee you lower run-out and better balance than any other bobbin available.

When you want to produce Quality yarns and fabrics with greater efficiency and economy, it is imperative that your bobbins are of equally high quality. Stehedco Precision Bobbins give you the high quality you require.

Quality SPINNING, WINDING, WEAVING
Needs Stehedco Precision Bobbins.
YOU CAN DEPEND ON STEHEDCO

QUALITY Stehedco CONTROL

STEEL HEDDLE MFG. CO.

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(B-6006)

A SKILLED HAND IN CHEMISTRY . . . AT WORK FOR YOU

NOPCO® KNOW-HOW

WORKS FOR TEXTILE MEN AT EVERY STAGE

WETTING AGENTS

Nopco 1186-A	A sulfated ester with outstanding wetting and rewetting properties for cotton fabrics
Nopco 1525	A 100% active nonionic ethylene oxide condensate with excellent acid stability
Nopco 2272-R	Low foaming sulfated ester. Performs as wetting and rewetting agent, penetrant, and dye leveler

SYNTHETIC FIBER LUBRICANTS

Nopcostat® Series	AS-40, LV-40, 2152-P, 2152-X. A family of highly antistatic lubricants for application to synthetic fibers and their blends. The Nopcostat Series provides the user with a range of fiber-to-metal and fiber-to-fiber frictional characteristics
Nopcotex® A	Non-soiling fiber lubricant recommended for processing natural and synthetic carpet staple
Nopcotex B	Processing aid for Corvel staple; anti-graphite lubricant for lace yarns

CONING OILS

Konrite® A	All-purpose antistatic coning oil. Medium viscosity with built-in detergency
Nopcone® AR	Low-viscosity antistatic lubricant specially designed for bulk yarns and low denier synthetic filament yarns
Nopcone LV	Extra-low-viscosity lubricant designed for bulk and stretch yarns, polyamide, polyester and polyacrylic filament yarns

WARP SIZING PRODUCTS

Nopcosize® N	Modified polyacrylic acid for sizing of filament nylon
Nopcosize D	Water-soluble polymeric size developed for slashing Dacron* filament yarns
Nopco 1111	Plasticizer and lubricant for rayon and acetate sizes. Also used extensively in the soaking of rayon crepe yarns
Nopco 1440	Warp size bath additive that acts as a plasticizer, lubricant and penetrant for rayon and acetate sizes
Nopcolube® 55	Lubricant added to polyacrylic acid size bath for Nylon to eliminate topwaxing

*Trademark of E. I. du Pont de Nemours & Co., Inc.

WOOL AND WORSTED OILS

Nopco FUA®	Self-scouring all fatty wool oil
Nopcostat 56-C	Antistatic oil recommended for use on all woolens. Applied in range of 3-5% owf
Nopco 100	Blended fatty lubricant for wool and synthetic fibers
Worsted Oil 12	Outstanding antistatic worsted lubricant. Provides optimum fiber-to-metal frictional characteristics and inter-fiber cohesion

DETERGENTS

Hyonic® PE	Series of polyoxyethylene condensates offering a range of oil and water solubility with numerous applications in the textile industry
Syntergent® 28-B	Nonionic raw wool scouring detergent
Syntergent 130-W	Low-temperature raw wool scouring detergent
Nopco 1479-D	Designed for the fulling and scouring of wool and worsted fabrics. High soda ash stability
Nopco 1658-C	An inexpensive detergent designed to replace soap for fulling and scouring on a pound-for-pound basis
Nopco 9092	Fulling compound with exceptional detergency. Will tolerate soda ash solutions as high as 14 ounces per gallon

DYEING AND FINISHING

Nopcotex	Trademark for Nopco's line of softeners. Products available for all phases of fabric finishing
Polymul® Series	Series of polyethylene emulsions used as pure finishes and softeners in resin formulations
Nopco 1425-B	Dye leveling and stripping agent recommended for acid, premetalized and chrome dyestuffs
Nopcosulf® Series	A group of sulfated vegetable, animal and marine oils which vary in activity and degree of sulfation. Used in dyeing, bleaching and finishing of cotton and synthetic fibers

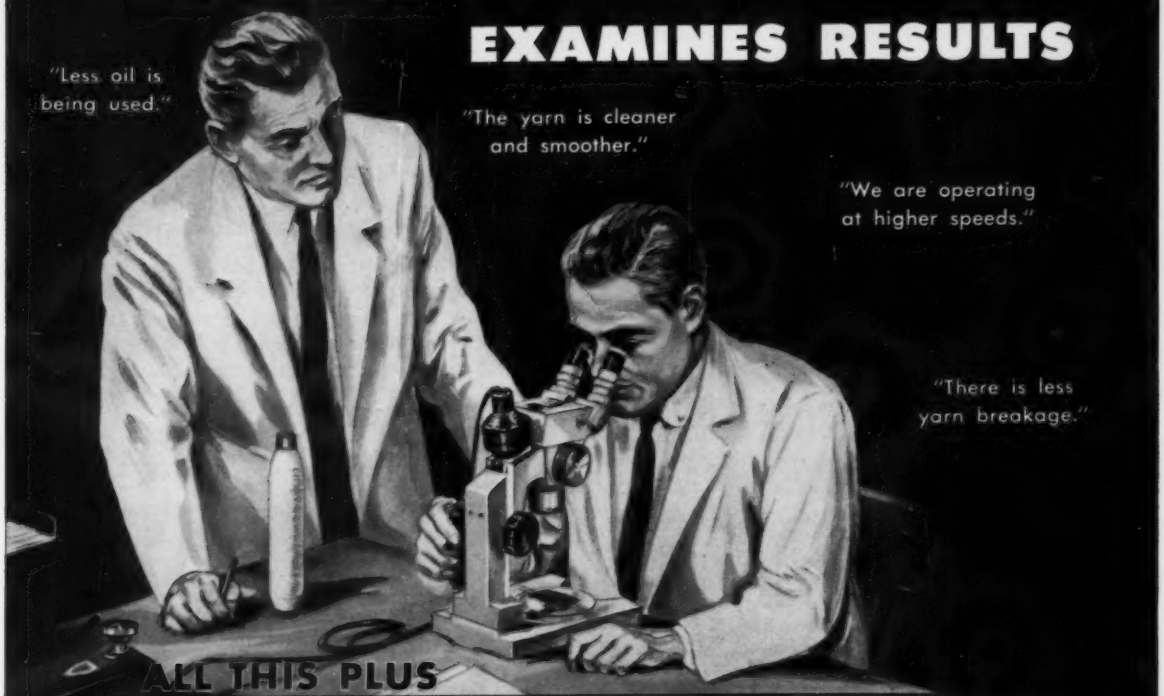
NOPCO®

NOPCO CHEMICAL COMPANY

60 PARK PLACE • NEWARK, N.J.

PLANTS: HARRISON, N.J. • CEDARTOWN, GA. • RICHMOND, CALIF. • LONDON, CANADA

A USER OF THE NEW "M" TYPE HERR CONICAL RING EXAMINES RESULTS



ALL THIS PLUS

- More Uniform Lubrication Without Oil Waste.
- Longer Traveler Life.
- Longer Ring Life.
- Reduced Maintenance.
- Increased Production.
- Decreased Costs.

Now, "M" Type Herr Conical Rings introduce a new method of lubrication called Seam Lubrication. By the principle of capillary attraction oil finds its way from the reservoir through the top and side seams to the wearing surfaces. The minute seams, so fine that they are hardly visible, control the amount of flow so that every drop of oil is utilized. There is no waste—no oil surplus to contaminate the yarn. The operation is clean. There is no rewicking. Maintenance costs are lowered. Oil consumption is greatly reduced, yet faster spindle speeds are possible without extra wear to ring or traveler.

The "M" type Herr Ring has been thoroughly tested for several years in some of the largest textile plants.

Write today. Let us give you all the facts that lead to greater profits for you.

Oil is Supplied to Both Top and Conical Bearing Surfaces Through Seams.

Oil Flows to Annular Reservoir Within the Ring, Then is Drawn by Capillary Action Through Seams.

The 5" diameter 43/64" face Herr "M" Type Ring has only one oil cup. Herr travelers are specially designed to provide best results with this ring.

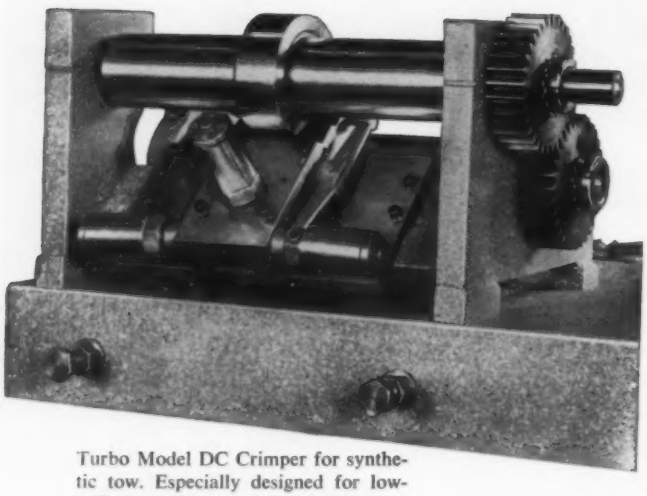
HERR MANUFACTURING CO., INC.

310 FRANKLIN STREET • BUFFALO 2, N. Y.

FOR SPINNING AND TWISTING WORSTED, WOOLEN, RAYON, NYLON, ORLON, FIBERGLASS AND BLENDED YARNS OF ALL TYPES

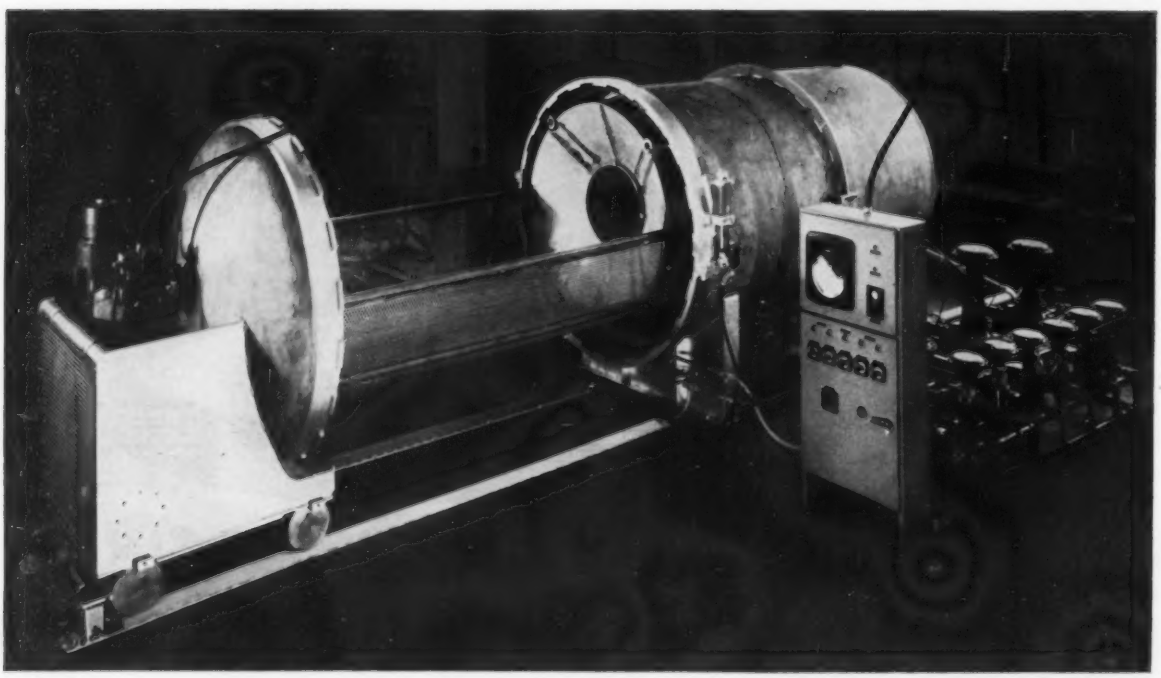
See us at Booth 267 at the Southern Textile Exposition-Greenville, S. C.

TURBO makes fibers behave . . .



Turbo Model DC Crimper for synthetic tow. Especially designed for low-stiffness, easily bent fibers. Can be used for crimping high tensile fibers which have been properly conditioned.

Turbo Model FS-1000 Fiber Setter. During processing, basket rotates or oscillates, eliminating need for separate bulking operation.



In the wonderful world of textiles — natural or synthetic — Turbo machines give fibers and fabrics sparkling new personalities. Here are just three of the many Turbo machines:

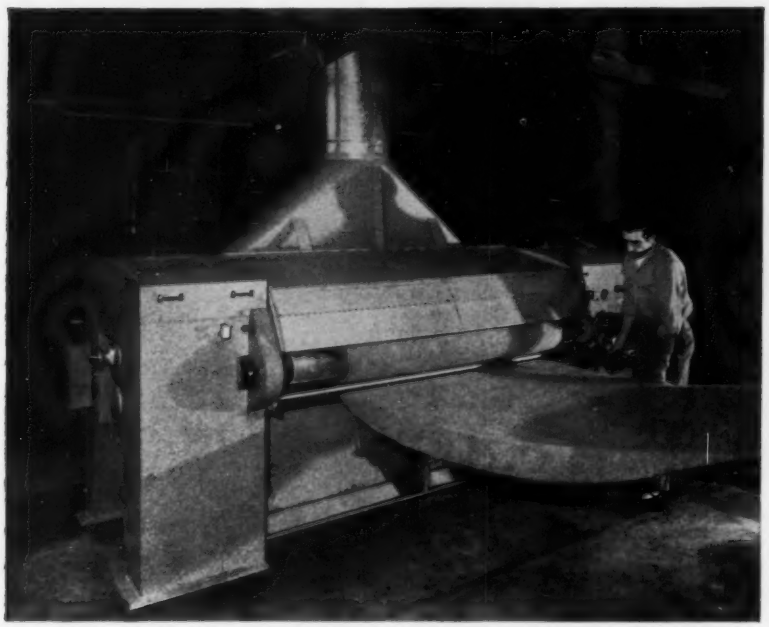
Turbo's Model FS-1000 Fiber Setter processes synthetic fibers in skeins, on bobbins, or as sliver. Capacity up to 1000 lbs. in every pressure/vacuum cycle. Completely automatic. Basket carrier is integral with door, and moves into cylinder at push of button.

Mill owners report that the Turbo Electro-Finisher adds up to $3 per yard to the value of woolen, and pile fabrics by improving appearance and hand. An electrically-heated cylinder separates and straightens the fibers, then polishes them to give new character and hand.

The Turbo Model DC Crimper uses air cylinders to assure proper roll pressure. Double and triple tow can be crimped in continuous operation. Fiber is compressed into ½-inch band as it enters the vertical stuffing box, resulting in secondary fold-over advantages.

Turbo builds a complete range of heat-setting machines for fibers, yarns, fabrics, and finished garments . . . dyeing, extracting and drying machines for skein and package yarns . . . finishing machines for wool and pile fabrics . . . Staplers and crimpers for converting synthetic tow to the finest staple . . . processing machines for tubular knit fabrics.

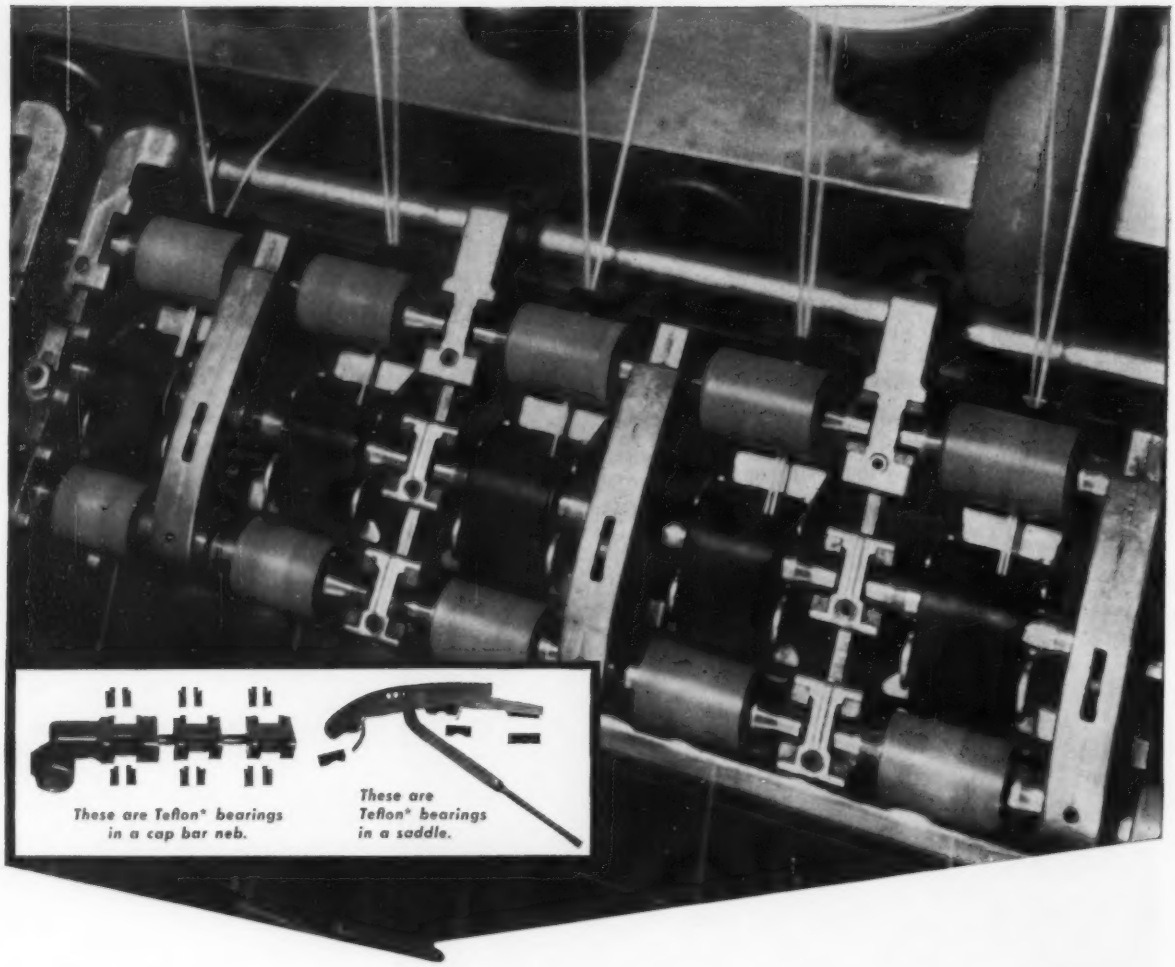
Write us your requirements.



Turbo Electro-Finisher polishes wool, and pile fabrics to a vibrant luster.

TURBO

TURBO MACHINE COMPANY, LANSDALE, PA., U. S. A.



Dixie Bearings introduces TEFLON*– a new way to cut maintenance costs on spinning, twister and speeder frames

Wherever our Dixie Bearings, Inc. engineers have recommended and installed Teflon* bearings in the replacement of oil impregnated bearings for die cast cap bars and saddles, our mill customers have been quick to approve. They tell us that Teflon* bearings *never need oiling* and are anti-stick which makes for a more efficient cleaning system. In addition, these long-life Teflon* bearings with their excellent wear properties reduce lap-ups caused by build-up of static charges. Simple to install by the easy hand press method, Teflon* bearings do not cut rolls or arbors.

Let us help you put these trouble-free Teflon* bearings to work for you. You'll enjoy better spinning operations, better quality yarn and lower maintenance costs.

Call your Dixie Bearings, Inc. engineer today.

Providing bearing service in the South

DIXIE BEARINGS, INC.

**DuPont Trademark*

ARKANSAS: Little Rock • **FLORIDA:** Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville • **LOUISIANA:** Baton Rouge New Orleans • **N. CAROLINA:** Charlotte • Greensboro • **S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville Memphis • Nashville • **VIRGINIA:** Norfolk • Richmond • Roanoke

▶ *Visit us at Booths 416-417 at the Southern Textile Exposition*

Don't Wait for Trouble...

Go Looking for it with the NEW WHITE-LIGHT STROBOTAC®

SPOT THESE SPINNING-ROOM TROUBLES:

excessive band and tape slippage • crooked idlers
poor spindle-spring pressure • crooked, split, or worn bobbins
wrong spindle speeds • spindles that need oiling • spindles out of plumb
uneven rings • worn travelers • slapping balloons

Type 1531-A STROBOTAC FEATURES:

★ *A light 70 times brighter* than previous model.

★ *A short-duration flash* that eliminates blur and lets you study details previously impossible to see.

★ *A long throw beam* that greatly speeds spinning-frame checks. The Strobotac can now be aimed along a row of spindles from the aisle and speed variations noted as the operator walks by without stopping.

★ *Extended speed-measuring range* to 25,000 rpm. Accuracy is ±1% of reading.

PRICE IS $260.

Write for complete information.

GENERAL RADIO COMPANY

WEST CONCORD, MASSACHUSETTS

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MORE FEATURES PER DOLLAR!

Taylor FULFLEX* Dye Cycle Controller fully field proven

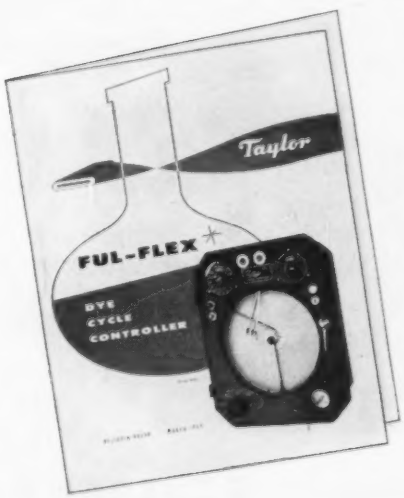
NEVER BEFORE has an instrument been so enthusiastically received by so many of the biggest mills in the country. Here at last is a dye kettle controller that has been designed in cooperation with Boss Dyers . . . designed to incorporate every feature they want.

The proven FULFLEX Controller gives you 30% more flexibility than any other controller on the market today. It's available in three models, giving as much or as little automatic control as you require. Prices are surprisingly low—installation costs the lowest.

In addition to the major features listed below there are many other important refinements, such as all-neon lights that last 150 times longer than the filament type; entire instrument in one standard case; a timer that is easily accessible from the front of the case; automatic rate of rise protection—rate of rise as originally set can never be exceeded, regardless of steam pressure fluctuations.

Ask your Taylor Field Engineer for a demonstration of this "Controller of Tomorrow." Or write for details to Taylor Instrument Companies, Rochester, N.Y., or Toronto, Ontario.

- Adjustable starting temperature
- Adjustable initial hold time
- Adjustable rate of rise
- Adjustable hold temperature
- Adjustable hold control times
- Adjustable add periods
- Adjustable forced cooling
- Adjustable end temperature
- Automatic Rinse



SEND FOR THIS NEW BULLETIN No. 98339

*Reg. U.S. Pat. Off.

Taylor Instruments **MEAN ACCURACY FIRST**

LOCAL SERVICE

1 **Now . . . wherever strapping materials are used**—selected local distributors offer new AVISTRAP cord strapping for a full range of packaging needs.

2 **New tool and accessory service**—Tools, seals and accessories available for immediate delivery from distributors' stocks. Repair service free on all tools.

3 **In-plant technical service by experts**—a highly-trained staff assists users in getting every benefit, every saving possible with AVISTRAP cord strapping.

4 **Fast, dependable deliveries** — an extensive distributor network, local inventories, assure dependable service for AVISTRAP users throughout the U. S.

AVISTRAP* CORD STRAPPING

Made from high-tenacity Avisco® rayon, AVISTRAP cord strapping out-performs metal strapping and reinforced tapes—at lower cost—in many applications. AVISTRAP is easy to handle; all coils weigh 21 lbs. Yardage equals 100 lb. coil of comparable width steel strapping. And AVISTRAP has no sharp edges, does not lash out if broken. Call the AVISTRAP distributor nearest you for a demonstration in your plant.

ALABAMA
Birmingham . . . . . Dillard Paper Co.
Mobile . . . . . Paper Products Co.

CALIFORNIA
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GEORGIA
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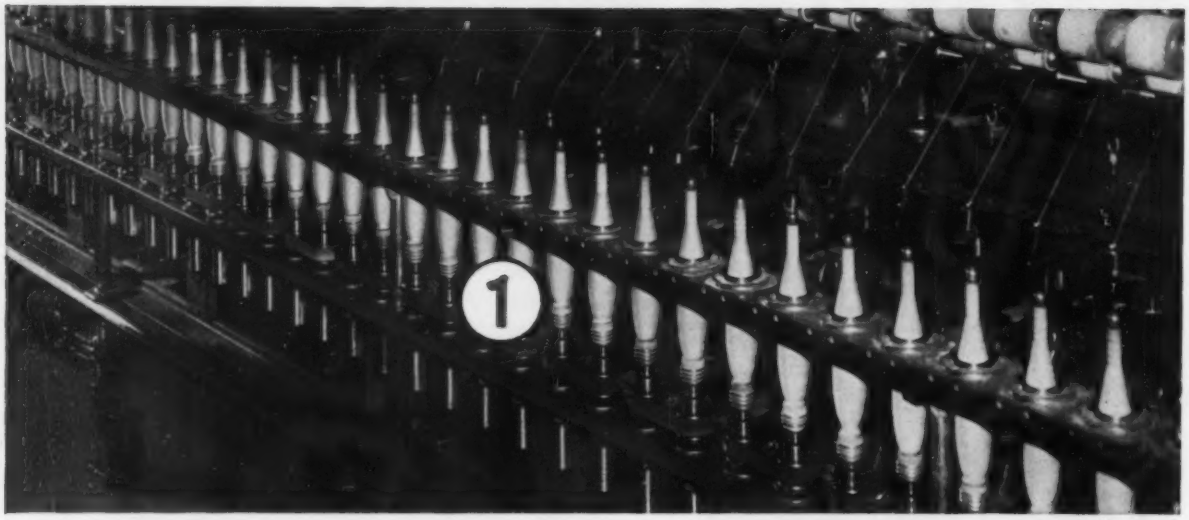
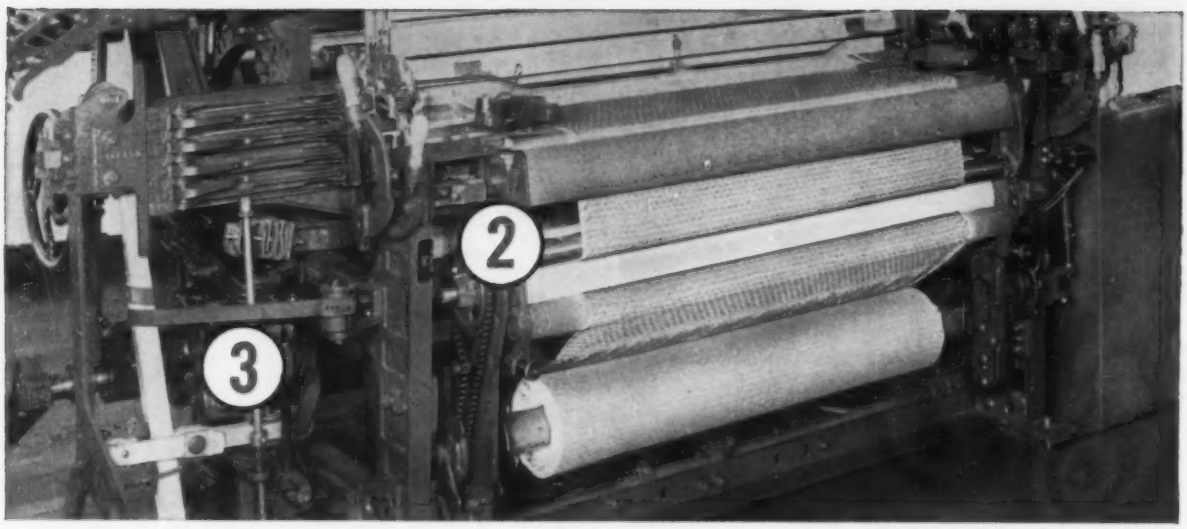
AMERICAN VISCOSE CORPORATION, INDUSTRIAL PACKAGING DEPT., 1617 PENNA. BLVD., PHILA. 3, PA.

*Trademark American Viscose Corporation • Patents pending.





ESSO LUBES STAY ON THE JOB

1. Spinesso® spindle oil stays put on bearing surfaces . . . minimizes startup and running friction and dampens vibration. Outstanding oxidation and color stability. Checks corrosion in humid atmospheres. Time-proven Spinesso does a fine job, too, in oil-lubricated twister and spinning rings. For grease-lubricated twister rings, Alert® adhesive white grease is recommended.

2. Nebula® EP multi-purpose grease replaces many greases . . . light to heavy! Excellent for loom gears and bearings. Outstanding in the hot, highly loaded bearings of size, dryer and calender rolls. Lubricates well under wet conditions, as found in mercerizing and scouring range bearings.

3. Millcot® anti-spatter oils stick well to rapidly moving parts and help keep down oil stains. Anti-wear agent maintains lubrication under heavy pressure and shock loading in looms. Millcot K prevents excessive leakage in older card comb boxes and spur gear cases. Millcot DX doesn't form oil "strings" and is readily scoured from fibers...an ideal lube for top roll bearings.

Efficient Esso lubricants save time, labor and machine wear. For more information contact your local Esso office, or write: Esso Standard, Division of Humble Oil & Refining Company, 15 West 51st Street, New York 19, New York.

Esso

In Industry after Industry..."ESSO RESEARCH works wonders with oil"

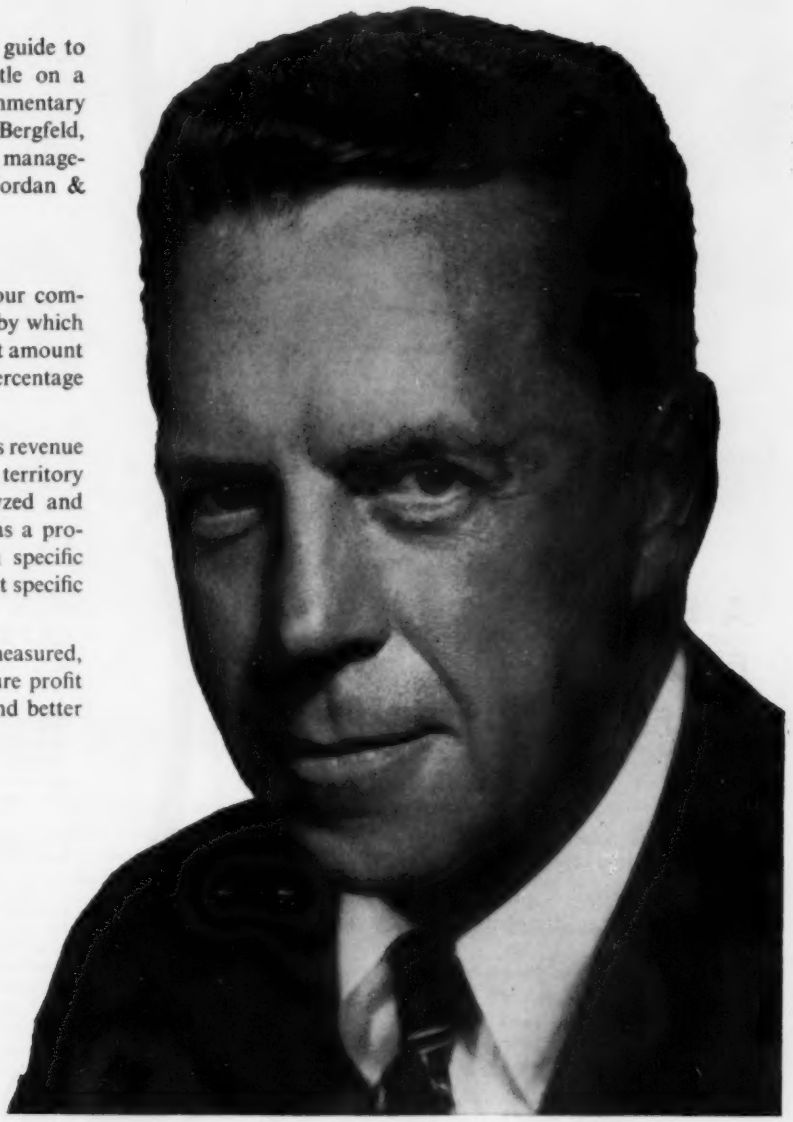
"What's so bad about basing the ad budget on last year's shipments?"

Management men, seeking a reliable guide to advertising appropriations, often settle on a percentage of sales. The following commentary on this practice was written by A. J. Bergfeld, President of the internationally known management consultant firm of Stevenson, Jordan & Harrison, Inc.

"Past practices of your own or of your competitors will produce no magic ratios by which you can either judge or budget the right amount of advertising automatically as a percentage of past sales.

"Plans for increasing sales volume, sales revenue and resulting profits by product and by territory or by divisions, can better be analyzed and approved by considering advertising as a programmed cost to be associated with specific profit plans and to be measured against specific results.

"Programming advertising costs as a measured, reasoned and integrated part of a future profit plan usually results in a better plan and better actual future profits."



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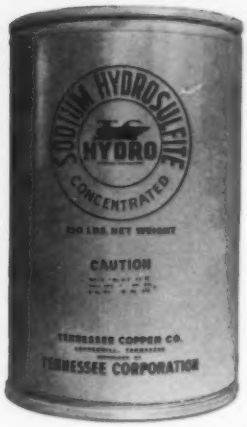
ASSOCIATION OF INDUSTRIAL ADVERTISERS

271 madison avenue • new york 16, n. y. • telephone murray hill 5-8921

An organization of over 4000 members engaged in the advertising and marketing of industrial products, with local chapters in ALBANY, BALTIMORE, BOSTON, BUFFALO, CHICAGO, CLEVELAND, COLUMBUS, DALLAS, DENVER, DETROIT, HAMILTON, ONT., HARTFORD, HOUSTON, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, MINNEAPOLIS, MONTREAL, QUE., NEWARK, NEW YORK, PHILADELPHIA, PHOENIX, PITTSBURGH, PORTLAND, ROCHESTER, ST. LOUIS, SAN FRANCISCO, TORONTO, ONT., TULSA, YOUNGSTOWN.

TC HYDRO



A BASIC PRODUCER FROM MINE TO FINISHED PRODUCT

Our basic position enables us to maintain a rigid quality control program from mine to finished product—your assurance of Sodium Hydrosulfite of highest purity.

TC Hydro is a dry free flowing crystalline powder of uniform size and structure—dust free, assuring highest stability and uniformity.

We invite inquiries.
For complete listing of our products see our inserts in CHEMICAL WEEK BUYERS' GUIDE, Pages 173-176 or CHEMICAL MATERIALS CATALOG, Pages 551-554.

TENNESSEE CORPORATION
612-629 Grant Building, Atlanta 3, Georgia

let's talk about...

Laurel Emulsions

. . . first in conditioning and lubrication of both natural and synthetic yarns.

One of these—or another—Laurel Emulsion for natural and synthetic yarns will do a better job, with less work, at lower cost. There's one best emulsion in the Laurel Line to condition and lubricate any yarn . . . better.

LAUREL RUXITE A

. . . a quality lubricating and conditioning agent for cotton, wool, and synthetic spun yarns. Adaptable to rayon novelty yarns, it improves softness and running qualities. Forms highly stable emulsions with water.

LAUREL HYDROWAX HC

. . . especially prepared for tufting yarn producers. Restores rayon, cotton, or blended yarns to proper condition and imparts lubrication for better-running yarns. Easy to apply evenly, it's completely saponifiable for protection in scouring and dyeing.

LAUREL HYDROCOP and 3B SOFTENER

. . . first choice of knitting yarn manufacturers. Gives smooth running and even stitches, making for stronger yarn with fewer breaks. Causes no odor or color changes; easy to prepare; for natural or synthetic yarns.

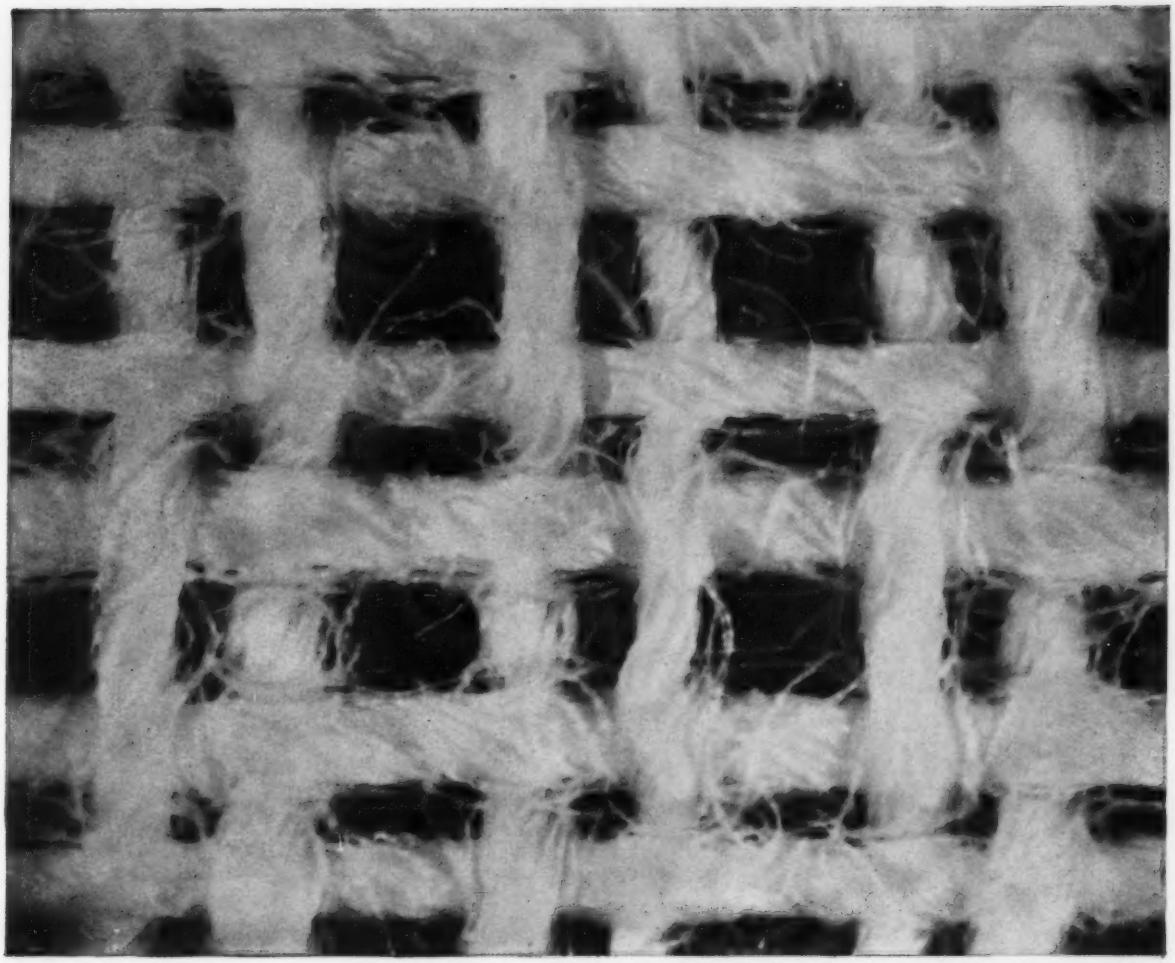
LAURELWAX EMULSION WG

. . . truly cold water dispersible and excellent for winding trough work. For treating cotton, wool, Orlon and other knitting and sewing yarns, it is used at no sacrifice in active content where hot water is a problem.

Laurel Brand — OVER 50 YEARS OF SERVICE TO INDUSTRY

Laurel
SOAP MANUFACTURING CO., INC.
TIOGA, THOMPSON & ALMOND STS. • PHILA. 34, PA.

Warehouses: Paterson, N.J. Chattanooga, Tenn. Charlotte, N.C. Greenville, S.C.



Photomicrograph of cotton bleached with hydrogen peroxide

High-white and handsome!

Textiles with high whites and handsome colors usually have the most eye appeal. Shell Chemical products play an important role in the production of today's attractive and useful fabrics.

Hydrogen peroxide, a rapid, economical bleach, also finds use as a developer for vat dyes. In the production of minimum-care cotton fabrics, Eponite® 100 imparts wrinkle resistance. It also is an ingredient in an antistatic finish for synthetics.

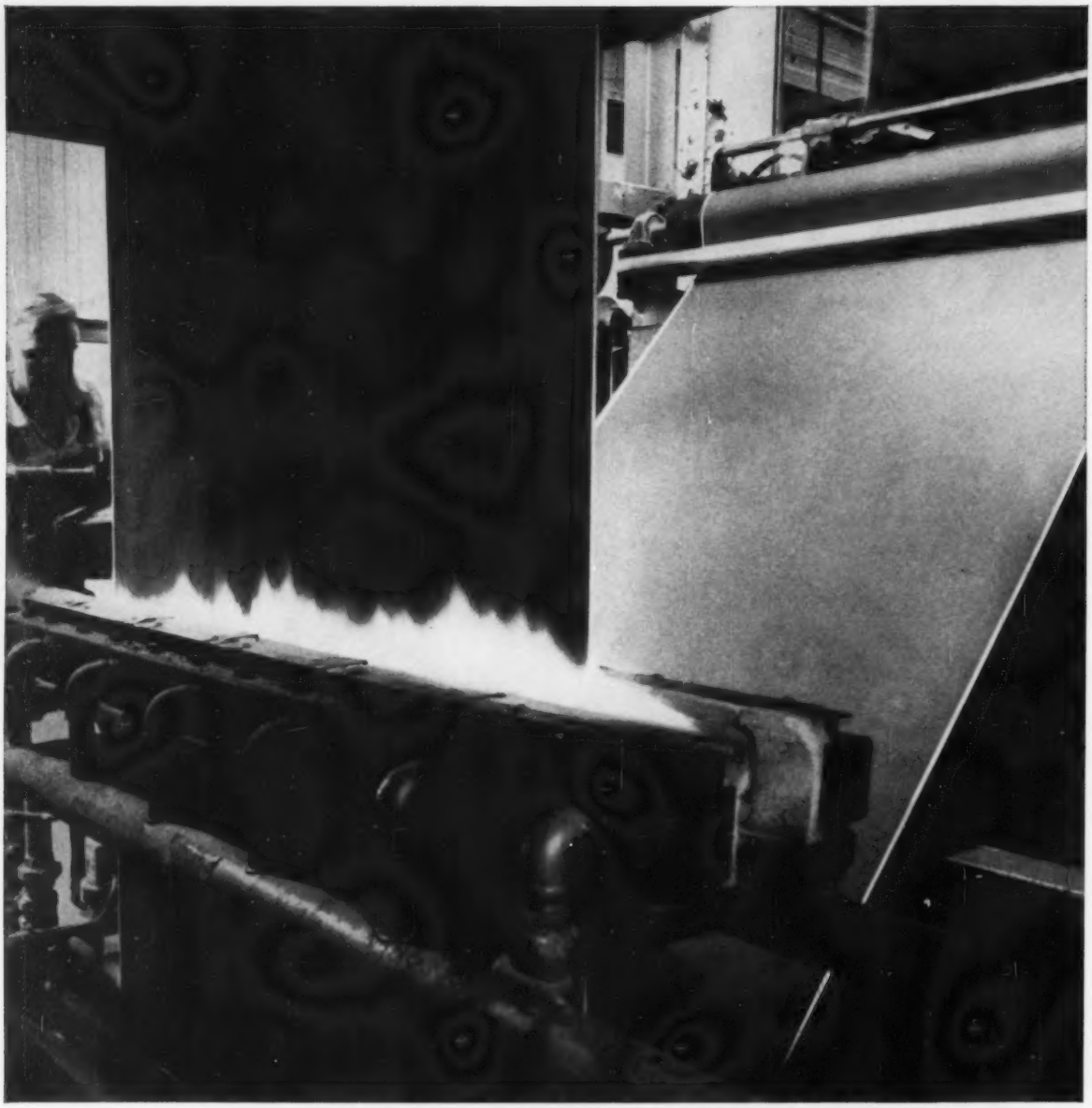
The cotton fibers shown in the picture were mercerized for added luster. Another Shell product, hexylene glycol, was used as a penetrant in this process. Glycerine is a mercerizing assistant and a moisturizer in pigment printing. Shell Chemical alcohols and ketones find use as resin solvents and dye dispersants.

Choose the chemicals for your own process requirements from the column at the right. A Shell Chemical representative will be glad to discuss your specific needs. Write or phone your nearest Shell Chemical office for samples and technical literature.

Acetone
Diacetone Alcohol
Epichlorohydrin
Eponite® 100
Ethyl Alcohol
Glycerine
Hexylene Glycol
Hydrogen Peroxide
Isopropyl Alcohol
Methyl Ethyl Ketone
Methyl Isobutyl Ketone
Sodium Sulfonates

SHELL CHEMICAL COMPANY
INDUSTRIAL CHEMICALS DIVISION

Atlanta • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco
IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited, Montreal • Toronto • Vancouver



Eliminate multiple passes. With modern gas-fired equipment you can singe any known fabric in one pass. Even high quality corduroy can get an exceptionally uniform singe in a single pass.

GAS equipment can help you speed production, improve quality, reduce operating costs

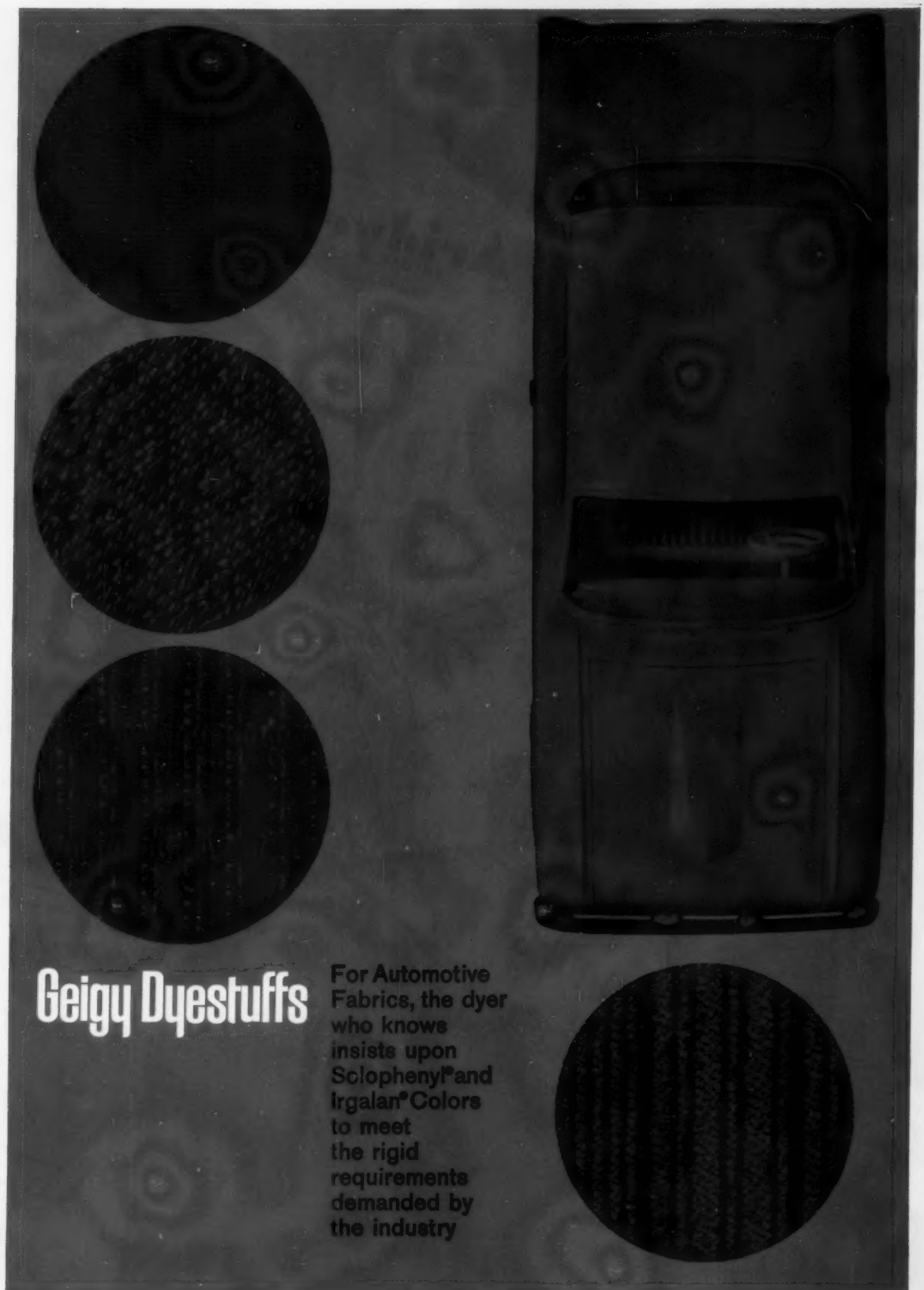
Whatever textile heating applications you have ... singeing, tenter frame drying, loop drying, nylon setting, calendering, can drying or setting of coatings ... modern gas equipment can help you solve many problems that affect production speed, quality and operating costs.

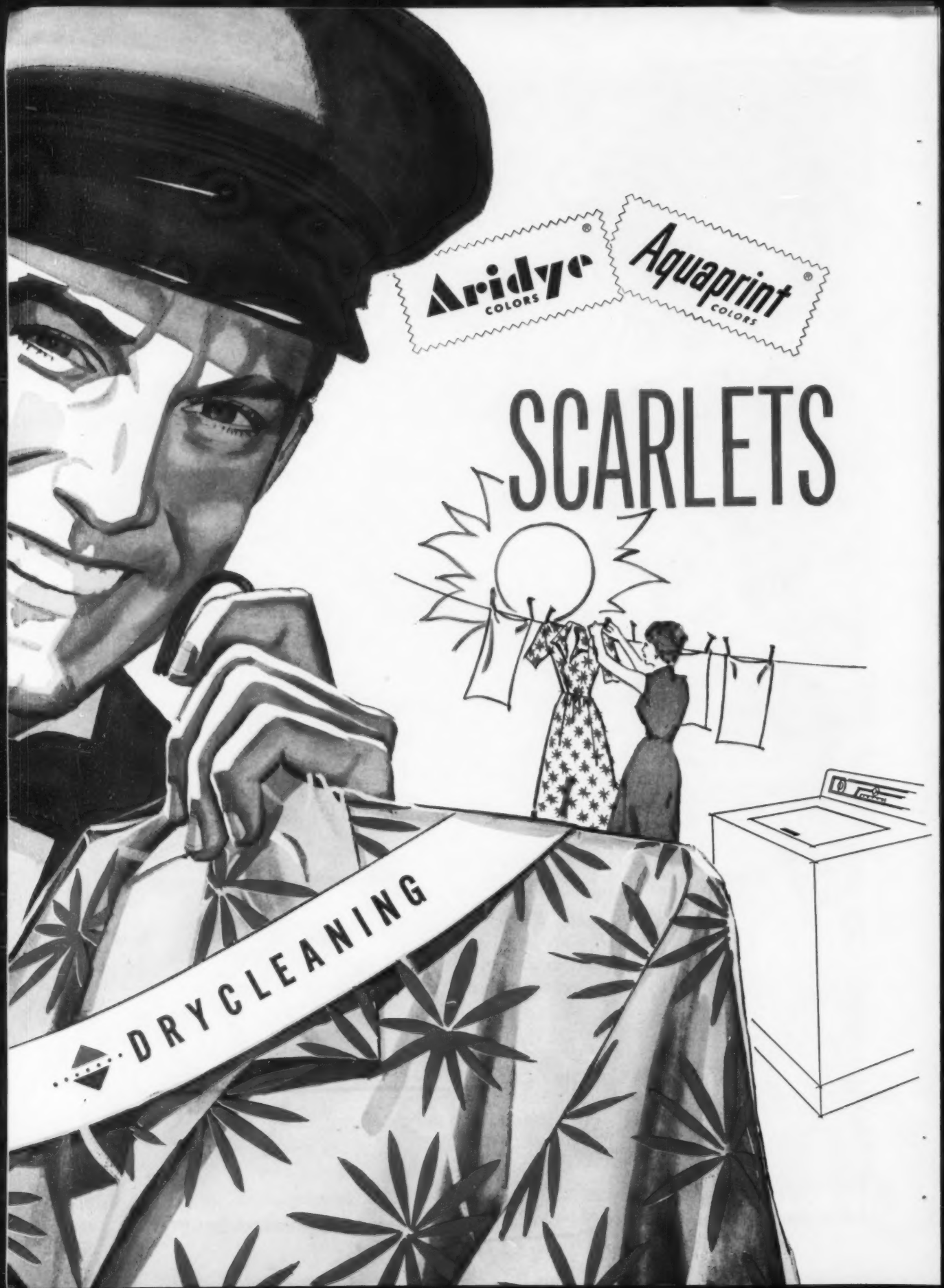
Only gas gives the precisely controlled, economical heat at high enough temperatures for the curing or setting of modern fabrics and finishes. Volume of heat, temperature and methods of application vary widely—but recent advances made in the design of gas-fired equipment give you all the flexibility you need.

Gas provides a large volume of heat in a small area, thus increasing production speed with a small investment in equipment. What's more, with the use of modern gas equipment or auxiliary burners you can eliminate the purchase of longer frames and expensive housings.

Let modern gas equipment help you solve your heat problems. Call your gas company specialist on textile operations. He'll show you the economies and results you can get with modern gas equipment especially designed for the textile industry. *American Gas Association.*

FOR HEAT PROCESSING, GAS IS GOOD BUSINESS!


Geigy Dyestuffs
For Automotive Fabrics, the dyer who knows insists upon Sclophenyl® and Irgalan® Colors to meet the rigid requirements demanded by the industry


Aridye COLORS
Aquaprint COLORS
SCARLETS
DRYCLEANING

and REDS

YOUR BEST CHOICE

. . . for pigment printing cottons, synthetics or blends . . . apparel or household fabrics.

Charted here you'll find an ARIDYE or AQUAPRINT SCARLET and RED that best fits your needs for virtually any end-use requirement.

If you aren't already using the colors in this outstanding range, it'll pay you to check their performance to Light . . . Washing . . . and Drycleaning too, BASED ON THE NEW, MORE-STRINGENT A.A.T.C.C. DRYCLEANING TEST METHOD 85-1960.

We'll be glad to send you samples and full information on any or all these colors. Simply write or phone the Color & Chemicals Division office nearest you

Color	Light	Washing (A.A.T.C.C. No. 4 Test)	Drycleaning (A.A.T.C.C. 85-1960)	Remarks
Scarlet RD	●	★	★	Yellowish red. Major feature: fastness to drycleaning. Useful in long cuts for coral shades. Suitable for discharge printing. Aridye only.
Scarlet 2Y	●	★		Bright, true scarlet. Blended with reds, it produces attractive red tones.
Scarlet Y	●	★		Bright, neutral scarlet. Important for printing dress goods and other washable fabrics. Now in Aquaprint Supra Series.
Pink Y	●●	★	★	Yellowish pink with excellent all-round fastness. Suitable for plisse.
Brilliant Fast Pink 3B	●●	▨	★	Brilliant bluish pink. Has good to excellent all-round fastness. Suitable for plisse.
Red RF	●●	★	□	Neutral red. Pigment developed by Interchemical. Excellent all-round fastness. Suitable for plisse. Now in Aquaprint Supra Series.
Red R	●	★		Bright red. Important for printing dress goods and other washable fabrics. Now in Aquaprint Supra Series.
Red 2R	●	★		Strong, bright red. Widely used for printing washable fabrics. Aridye only.
Red RB	●	★		Strong, bluish red. Especially useful for printing dress goods and other washable fabrics. Aquaprint only.
Red RNB	●	★		Strong, bluish red. Especially useful for printing dress goods and other washable fabrics. Aridye only.
Red B	●●	★	□	Bluish red. Has excellent all-round fastness. Suitable for plisse and discharge printing. Now in Aquaprint Supra Series.
Red 2B	●	★	▨	Strong, bluish red with good to excellent all-round fastness. Useful as a base for producing maroons and wines. Now in Aquaprint Supra Series.
Red 3B	●	★	□	Bright, bluish red with good to excellent all-round fastness. Suitable for plisse and discharge printing.
Red DY	●●	★		Bright, yellowish red for producing prints with excellent fastness to light and washing. Suitable for plisse. Aridye only.
Bright Red DF	●	★	▨	Bright, neutral red with good to excellent all-round fastness. Suitable for plisse and discharge printing. Now in Aquaprint Supra Series.
Brilliant Red	●		★	Brilliant red. Excellent to drycleaning. Useful for printing synthetics. Employed for brightening up reds. Suitable for discharge printing.

★ Excellent fastness

● Meets normal dress goods requirements

●● Meets normal drapery requirements

□ Slight loss in depth in 1:100 cut

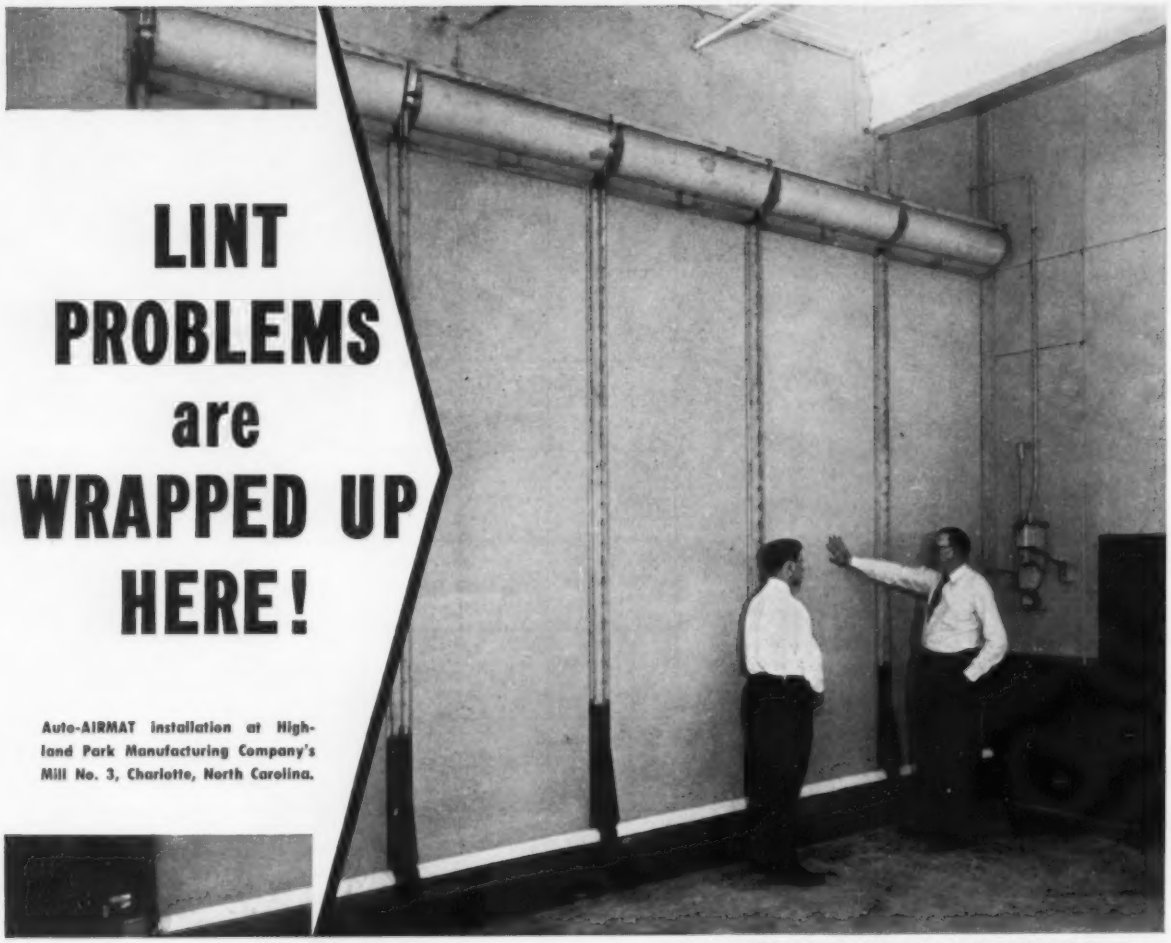
▨ Moderate loss in depth in 1:100 cut

Tested in accordance with A.A.T.C.C. Test Methods. Ratings are based on cotton prints in 1:2, 1:10, and 1:100 cuts. Ratings may be different in longer cuts.

Interchemical CORPORATION *Color & Chemicals Division*

Pawtucket, R. I. • HAWTHORNE, N. J. • Rock Hill, S. C.

LINT PROBLEMS are WRAPPED UP HERE!



Auto-AIRMAT installation at Highland Park Manufacturing Company's Mill No. 3, Charlotte, North Carolina.

Air Conditioning system designed by J. E. SIRRINE & CO., Greenville, S. C. Installed by WHITE AND COMPANY, Charlotte, N. C.

Auto-AIRMAT Installation Eliminates Lint Automatically At Highland Park Plant

LINT never gets a chance to foul up air washers here! AAF Auto-AIRMAT lint filters stand guard on two air conditioning systems supplying 111,000 cfm of air to spinning and carding rooms.

The Auto-AIRMAT is the *only* filter designed specifically for lint. Airmat filtering material, installed in roll at top of unit, moves down the face of the filter and is re-rolled at bottom with its lint load. As the curtain collects lint, new material automatically unrolls to keep resistance at proper level. And collected lint is wrapped up in a handy disposable roll!

If you've got a lint problem, get the facts on the *lint filter*—AAF's Auto-AIRMAT. Call your local American Air Filter representative, or write direct for Bulletin 234. Address: Mr. Robert Moore, American Air Filter Company, Inc., 275 Central Avenue, Louisville, Kentucky.

AAF **American Air Filter**

BETTER AIR IS OUR BUSINESS

Eastman now offers textile finishers 3 basic types of polyethylene

New EPOLENE resins enable textile chemists to formulate broader range of softeners

The wide range of properties now available in Eastman's Epolene series provides greater flexibility in formulating polyethylene emulsions for softening "wash and wear" cottons and synthetics, and for textile lubricants and sizes.

Permanent, low in color, non-chlorine retentive and easy to prepare, emulsions based on Epolene polyethylene give you a practical and economical method for improving the hand, abrasion resistance and tear resistance of "wash and wear" treated fabrics.

With Epolene, you can prepare any kind of emulsion system, cationic, anionic or non-ionic, with solids contents of up to 40%.

Choose from three different low-molecular-weight resins to obtain the right emulsion properties and finishing characteristics for your equipment and service.

Epolene E is the highest-molecular-weight resin of the three. It produces stable, low-color emulsion systems of superior quality for use in softening cottons or synthetics, or as a lubricant to reduce needle-cutting and increase sewability. Like other Epolene resins, it needs no curing, lasts through repeated launderings and resists dirt pick-up and redeposition.

Epolene LVE, a new resin type, has a lower melt viscosity than has Epolene E, thus offering somewhat better handling characteristics. Epolene LVE is softer than other resins in the series. The stability of its emulsions in the presence of resin catalysts is outstanding, especially at the low end of the pH scale, as indicated by its relatively high HLB factor.

Epolene HDE is the first high-density, emulsifiable low-molecular-weight polyethylene on the market. Because it is much harder, it improves significantly the abrasion resistance and tear resistance in cotton and cotton blends. Its stability and permanence are excellent. It, too, offers easier handling characteristics during emulsion preparation because of its low melt viscosity.

If you are formulating polyethylene softeners and would like to produce stable, economical emulsion systems of superior all-'round characteristics, look to Epolene from Eastman. Let us introduce you, also, to new time-saving and cost-cutting emulsifying techniques developed at our textile laboratories. For more information on the formulating and performance advantages of these superior polyethylene resins or for specific formulating assistance, write your nearest Eastman office. We invite your inquiry.

Property	Epolene E	Epolene LVE	Epolene HDE
Molecular Weight	2500	1500	1500
Density	0.938	0.939	0.956
Ring and Ball Softening Point, °C. (ASTM D-36-26)	104-108	104-105	110-111
Penetration Hardness (100 g./5 sec./77°F., tenths of mm.)	2	5	1
Color (liquid), Gardner scale, max.	2	2	2
Brookfield Viscosity (cps. @ 120°C.)	1500	400	455

Epolene

EASTMAN low-molecular-weight polyethylene resins

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; Atlanta; Chicago; Cincinnati; Cleveland; Detroit; Framingham, Massachusetts; Greensboro, North Carolina; Houston; New York; Philadelphia; St. Louis. **West Coast: Wilson and Geo. Meyer & Company,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

MODEL 77 CONE

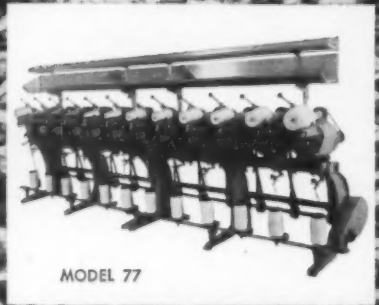
MODEL 78 CONE

MODEL 35 CONE

FOSTER MACHINES

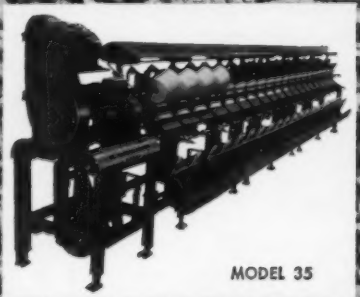
For Winding Tufted Textile Yarns

Let Us Recommend
the One Best Suited to Your Requirements



MODEL 77

MODEL 78



MODEL 35

Each of these machines is designed for a different situation. Each does a highly creditable job within its scope. Here are the details: —

MODEL 78 — This machine (built in 5 spindle units) produces 8" to 10" traverse, precise wind cones up to 16" in diameter and weighing up to 35 lbs. each. Ball bearing spindles are individually motor driven at speeds up to 800 R.P.M. It has controlled slow start and spindle brake, heavy duty belt gainer with hand wheel adjustment (or positive gear gainer, if desired), positive size stop, electric drop wire and expansion type cone holders, with handle control, for easy donning and doffing. Will wind overend from bobbins or from swifts, reels or unrolling devices.

MODEL 77 — Built in 6 spindle sections, produces 4" to 8" traverse, precise wind cones up to 10" in diameter and weighing up to 14 lbs. each. Ball bearing spindles, individually belt driven by one motor, run at speeds up to 1100 R.P.M. It has a positive, long wearing package brake and positive solid tapered pulley belt gainer. It will wind overend from bobbins, or from swifts, reels or unrolling devices. 90° build-up from face of cone prevents broken back or under-wound packages.

MODEL 35 — Built in units of 10 spindles to 80 spindles. Produces open wind 8" traverse cones up to 11" in diameter and weighing up to 9 lbs. each. Winding speeds from bobbins is from 180 to 250 Y.P.M. and from skeins 100 to 150 Y.P.M. Standard taper cone holders are 7° 22½' and 3° 51'. Package brakes and disc waxing attachments are extra. Can be equipped to wind from swifts, etc. as well as from bobbins.

Write for Model 78 bulletin A-98A, Model 77 bulletin A-99, or Model 35 bulletin B-46A.

FOSTER MACHINE COMPANY

Westfield, Massachusetts, U.S.A.

Member of American Textile Machinery Association

Southern Office, Johnston Bldg., Charlotte, N. C.
Canadian Representative, Ross Whitehead & Company Limited, 2015 Mountain St., Montreal, Que. and 100 Dixie Plaza, Port Credit, Ont.

European Representative, Muschamp Textile Machinery (Sales) Limited, Elder Works, Wellington Road, Ashton-Under-Lyne, Lancashire, England.

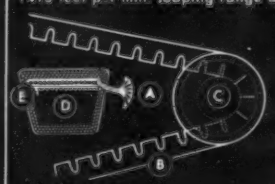
138-9

8 straight years of "no-problem" service! That was a lot more than this Southern textile mill expected from any V-belts when they contacted the G.T.M.—Goodyear Technical Man. But he knew COMPASS-V-Steel Belts with the Green Seal could handle the toughest assignments—confidently recommended a 10-belt matched set for this 24-hours-a-day, 5-to-7 days-a-week operation. Result: with only 2 minor adjustments in the whole 8 years, the G.T.M.'s belts have made this always-busy screen-print soaping range virtually no problem to the maintenance department. At last report, in fact, these Green Seal V-Belts still looked good for years more service.

Green Seal, Compass —T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR INDUSTRIAL PRODUCTS GTM-Specified

COMPASS-V-Steel Belts for 1413 feet per min. soaping range drive



All COMPASS-V-Steel Belts are now notched

A Load-carrying section of endless high-tensile steel cable

B Vents open between pulleys, dissipating heat

C Vents compress rounding pulleys, giving continuous gripping surface

D Highest-quality rubber underbody

E Sturdy bias-laid fabric cover resists wear

Even the hard-eyed G.T.M. often underestimates the dependability—and longevity—of industrial rubber products he recommends.

For you can't beat Hose, Conveyor Belts, or other products with the Goodyear label. For tips on how to get more out of any one of them, check your G.T.M.—Goodyear Distributor team. You'll find the phone number under "Rubber Goods" or "Rubber Products" in the Yellow Pages. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

lots of good things come from

GOODYEAR

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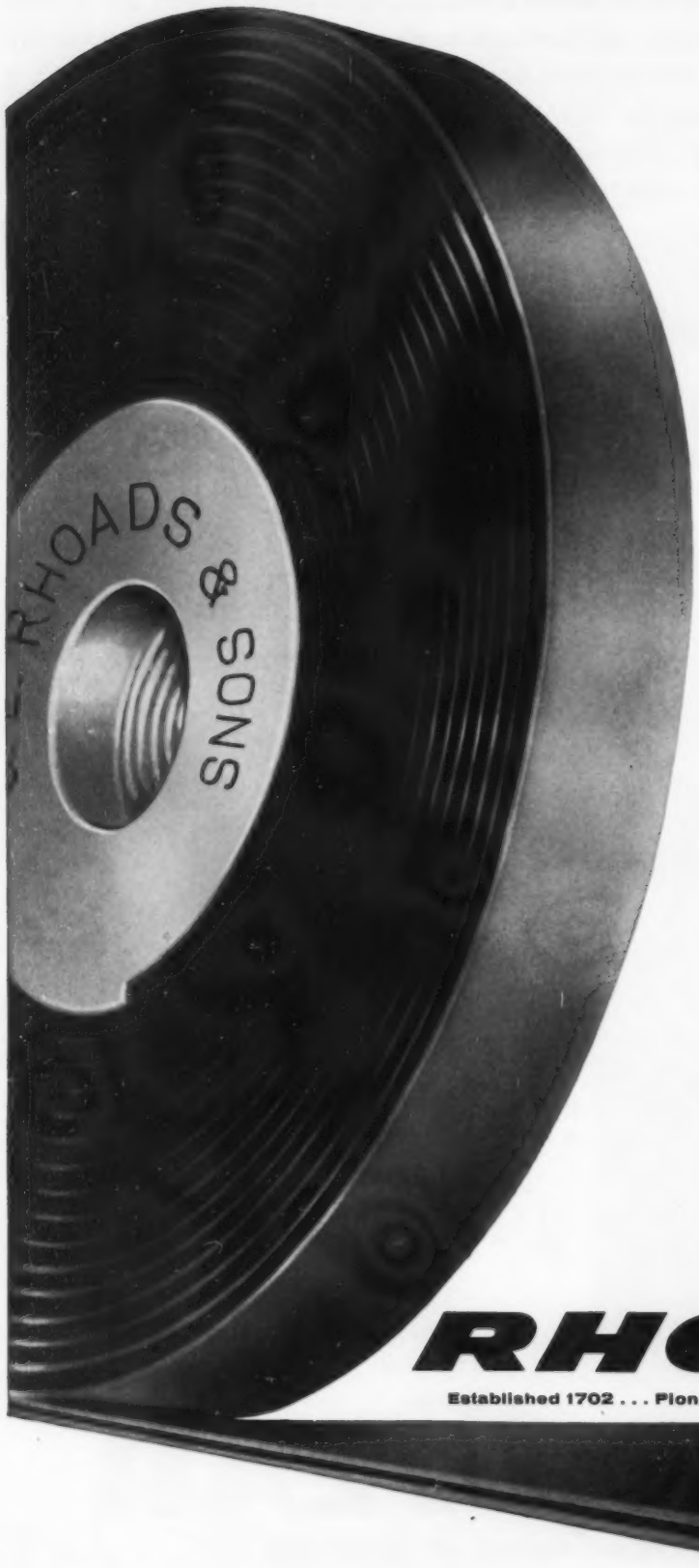

New Economies in Flat-Belt Operation

Tanastic, the nylon core leather belting by Rhoads, makes no maintenance demands. Will not slip because it is stretch-free. Maintains tension, runs straight and true. Tanastic starts up without slipping, and runs at highest speeds required in mill operation.

Ask a Rhoads belt-drive engineer about Tanastic nylon core leather belting, Texalon nylon core synthetic belting, or famous Rhoads Tannate leather belting. Literature on request. Address Engineering Department, J. E. Rhoads & Sons, Wilmington 99, Delaware.

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Economical cationic softener for plain quality finishes.

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Sonoco tubes range from standard types to those which possess *startling* crush, break and torque strength. In the wide scope of Sonoco experience is the "know-how" to produce the tube you want and need.

Sonoco tubes are typical of the dependable products manufactured by a fully integrated company with 60 years' experience in creating and producing all types of paper textile carriers. *Only Sonoco,* in its field, provides the necessary knowledge, skill and capacities to meet the ever-changing techniques of the textile industry. *Let Sonoco experience help you!*

See Sonoco!
Southern Textile Exposition
Greenville, S. C.
October 3 - 7, 1960
Booth 244

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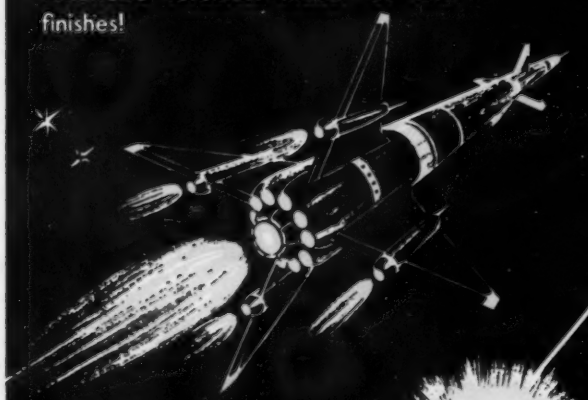

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LANOLIZED FINISHES: Produce fabrics with unusually desirable cosmetic properties and superior comfort against the skin.

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Du Pont's New Rapid Bleach Process Cuts Bleaching Costs... Improves Dyeing Quality

DU PONT
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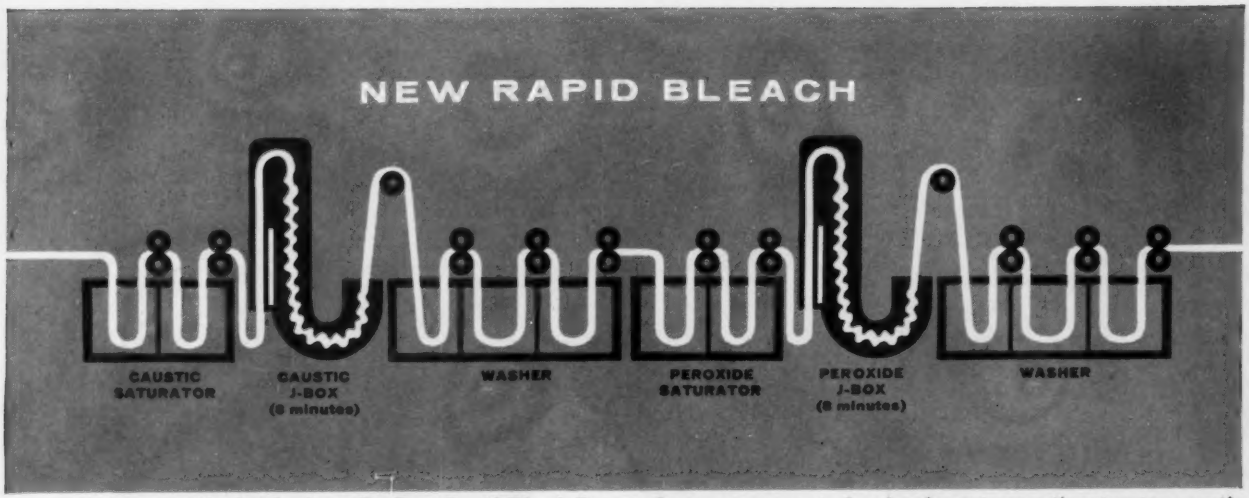
ALBONE® hydrogen peroxide **SOLOZONE®** sodium peroxide **PERDOX®** sodium



Diagrammatic sketch of new Du Pont Rapid Bleach Process shows arrangement of major elements: caustic saturator, caustic J-box, washer, peroxide saturator, peroxide J-box and final washer. Operation saves time, cuts operating costs. It can be used for medium-weight cotton fabrics and is especially suitable for hard-to-handle heavyweight fabrics that are susceptible to bruising.

Production-scale operations prove the superiority of the Du Pont Rapid Bleach Process over conventional methods for preparing heavy cotton fabrics for dyeing and finishing . . . at a lower cost.

The new Du Pont Process (shown above) prepares fabrics for finishing with high absorbency and exceptionally good dye receptivity. You obtain high color values and much greater clarity from the dye colors used. And you do it faster and easier.

Du Pont Rapid Bleach is a continuous process . . . specifically designed for medium to heavyweight fabrics. It's unique, simple and fast. Has caustic pre-treatment in the first J-box. The new two-stage process reduces cloth storage time to as little as 8 minutes in each J-box. Makes substantial savings possible over batch methods.

This new method introduces an open-width, continuous process designed for the preparation of sensitive fabrics (such as twills, drills, poplins, etc.) for dyeing. It reduces seconds and rejects due to bruises, rub marks and creases and can be readily adapted to any continuous, or semi-continuous, open-width system.

If you'd like more information on new Rapid Bleach, call your Du Pont Representative. He's a specialist in textile bleaching and will be glad to show you how this new process may profitably fit into your mill.

DU PONT BLEACHING PRODUCTS

assure you of the best bleaching results every time. They help speed bleaching operations more economically. They're thoroughly tested and proved out in successful mill operation. All are readily available from convenient shipping points to assure prompt delivery. Du Pont, Electrochemicals Department, Peroxygen Products Division, Wilmington 98, Delaware.

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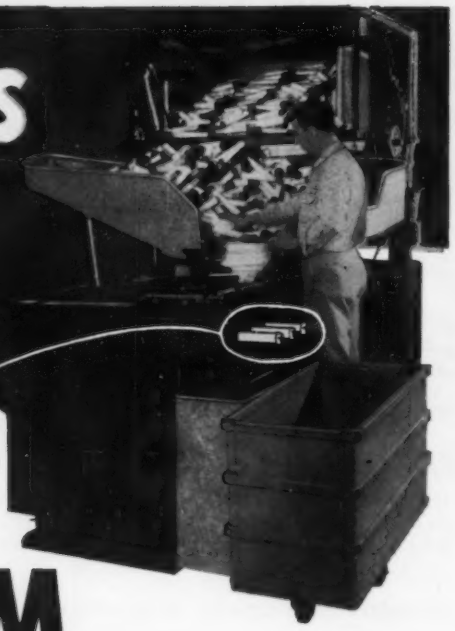

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Let a Terrell engineer show you how this equipment can save you money.

NEWS IN BRIEF

Textile Earnings to Rise? Rising earnings appear probable for the domestic textile industry in the

sixties, according to the **Value Line Investment Survey**, basing its prediction on the halting, or in part reversal, of fundamental unfavorable trends — overcapacity, trend of consumer spending to durable goods, and loss of export markets and rising imports. Looking at the import situation, the **Survey** comments that the U. S. textile industry may conceivably get some tariff assistance if the problem worsens.

Wool Duties Abolished. President Eisenhower has signed a new law permanently suspending import duties on 44s and 46s wool grades used in carpets and papermakers' felts.

Wash-and-Wear Continues Increase. Easy-care finishes were applied to 41 per cent of the yardage in outlets comprising the major share of cotton's domestic markets in 1959, up 7 per cent from 1958, according to a National Cotton Council survey. Production of wash-and-wear fabrics totaled about 3 billion linear yards in 1959, with cotton accounting for 63 per cent, all-synthetic fabrics 18 per cent, rayon 13 per cent, cotton-synthetic blends 4 per cent, and synthetic blends 2 per cent. ". . . a leveling off in production suggests that consumers are waiting for further improvements in easy-care qualities rather than that the demand for easy-care products has been saturated," according to the Council. [For another opinion, see page 97.—The Editors.]

Soviets to Out-Produce U. S. Textile Industry? Speaking before the Supreme Soviet of the U.S.S.R. recently, Premier Khrushchev reported that a Russian goal is to

overtake and surpass the United States by 1970 in the production and consumption of fabrics. Commenting on this, the chief of the light industry department of the U.S.S.R. State Planning Committee reported, "It can be said with full

Cotton, Silk, and Man-Made Fiber Broad Woven Goods Finished

Type of goods	Production (Thousands of Linear Yards)				
	1958	1957	1956	1955	1954
Bleached, dyed, or printed goods, total	9,232,365	9,786,732	10,244,543	10,501,865	9,595,047
Cotton	7,238,131	7,705,356	8,076,702	8,143,628	7,407,348
Man-made fiber fabrics and silk	1,994,234	2,081,376	2,167,841	2,358,237	2,187,699
Bleached and white finished goods, total	3,466,961	3,756,456	3,776,577	3,667,593	3,376,427
Cotton	3,184,122	3,464,653	3,490,780	3,346,394	3,179,589
Man-made fiber fabrics and silk	282,839	291,803	285,797	321,199	196,838
Plain dyed and finished goods, total	3,791,834	3,932,541	4,151,328	4,319,787	3,981,614
Cotton	2,354,537	2,446,050	2,593,737	2,671,479	2,308,304
Man-made fiber fabrics and silk	1,437,297	1,486,491	1,557,591	1,648,308	1,673,310
Printed and finished goods[1], total	1,973,570	2,097,735	2,316,638	2,514,485	2,237,006
Cotton	1,699,472	1,794,653	1,992,185	2,125,755	1,919,455
Man-made fiber fabrics and silk	274,098	303,082	324,453	388,730	317,551

[1]Includes roller, screen, flock, and block printed.

Source: Bureau of the Census.

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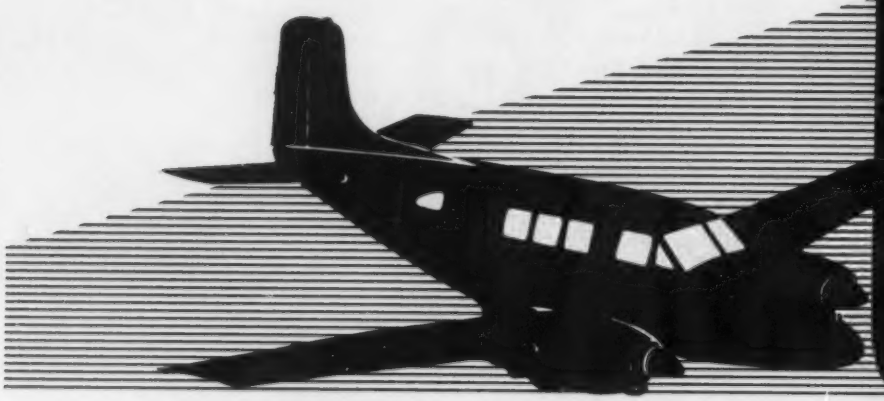

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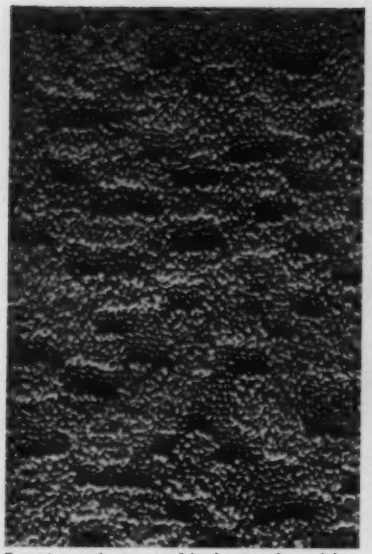
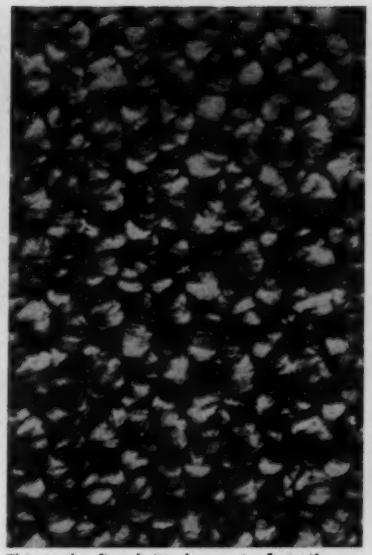
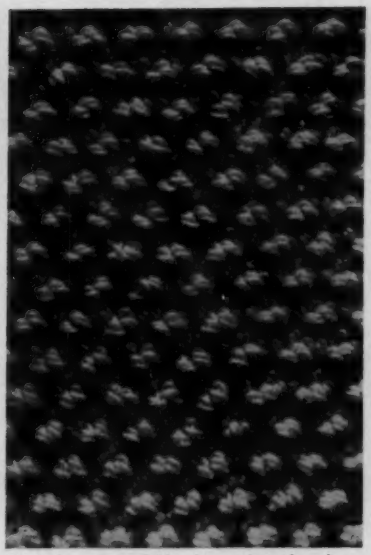
Beechcraft AIRFLEET OF THE TEXTILE INDUSTRY



Experimental carpet of high cut pile and low loop pile, of Caprolan textured nylon, was produced in one operation on new electronic tufting machine.



This is the first knitted carpet of continuous filament nylon. Called "Aristique," it's made by Callaway Mills, of textured Caprolan, and is "ombre-dyed."



Knitted carpet of Verel was introduced recently by Roxbury Carpet Co. Called "Homecraft," it simulates a hand-made needlepoint carpeting.

confidence that, inspired by the great ideals of communist construction, Soviet textile workers will spare no effort to reach that historic landmark much sooner than planned."

Council Fights Gin Damage. The National Cotton Council has released a 15-minute color film, "Profits and Markets Through Quality Preservation," which tells why cotton markets and profits are

increased when quality is preserved during harvesting and ginning. Causes and consequences of fiber damage through misuse of equipment are illustrated. The film also shows practical procedures to preserve lint quality and bring highest returns.

England Likes U.S. Fabrics. American mills report considerable interest from England since that country relaxed restrictions on U.S.-made goods some time ago. Men's suitings are said to be attracting the most attention. However, mill men are tempering their comments with some pessimistic notes: Japan will undoubtedly soon make the same types of good, at considerably lower prices, and if imports reach any substantial figure, the British government may well reimpose the former restrictions.

Cotton Quality TV Subject. The cotton quality problem was reviewed in depth on an eight-part television series presented weekly during July and August on the Alabama Educational Television Network. The ten-minute programs were a joint project of the TV

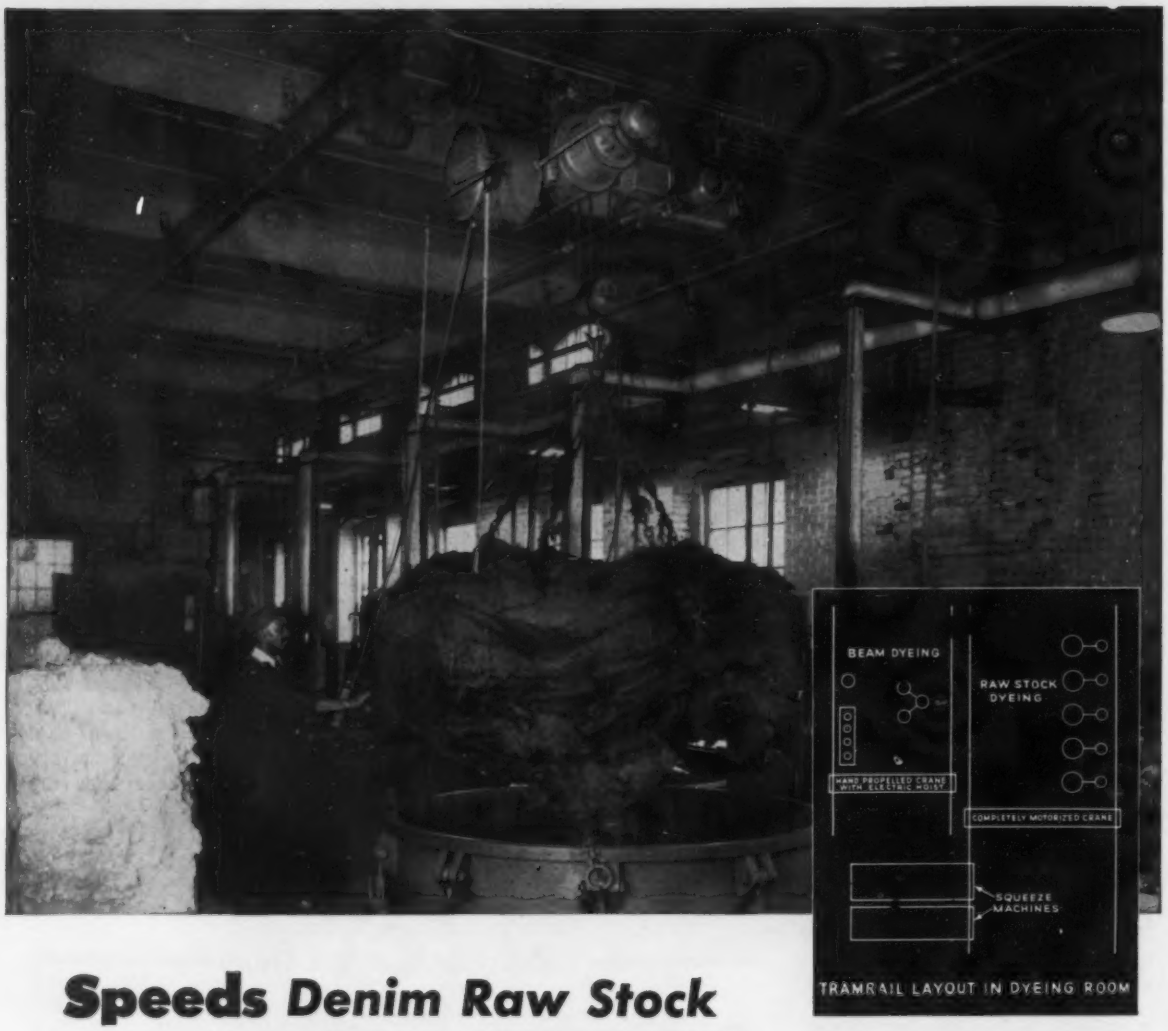
Labor-Management News

"Runaway" Plant Ordered Reopened. An arbitrator has awarded $204,681 in damages to a union in a recent decision and ordered a garment manufacturer to reopen a plant in New York City. The union, Amalgamated Clothing Workers, had classed Hickory Clothes, Inc., as a "runaway employer" after the firm opened a plant in Coffeeville, Miss., and closed its New York operation. The firm is appealing the decision.

No Segregation—TWUA. Textile Workers Union of America has refused its locals the right to use union money for support of racially segregated projects. The ruling specifically prohibited Local 371 of Front Royal, Va., from purchasing debenture bonds to finance private, segregated schools.

NLRB Cases Set Record. National Labor Relations Board reports a new record of 21,633 cases in 1959, up 29 per cent from the previous record set the year before. The

increase came principally from charges of unfair labor practices, 59 per cent of which were filed by individuals. Charges of unfair labor practices against employers were up 36 per cent; against unions, 24 per cent. Unions won 62 per cent of the representation elections conducted by NLRB, about the same proportion as in 1958.



Speeds Denim Raw Stock Dyeing and Handling

A THREE-TON completely motorized Cleveland Tramrail Crane was installed in the Dye Room of a leading North Carolina denim mill. This serves five 1500-pound dyeing machines. It speeds the handling of heavy kier covers and bulky wet cotton charges.

The hard manual work formerly required has been eliminated. Time lost in loading and unloading the dyeing machines is greatly reduced and consequently they can be in dyeing service a greater part of the time.

Because of satisfaction with the first crane, another crane was purchased and installed in an adjacent bay to serve a two-kier Gaston County dyeing machine for beam dyeing. This is a hand-propelled crane with electric hoist, that greatly facilitates the handling of beams in and out of the dyeing machines, extractor and dryer.

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Woolen and Worsted Machinery in Place by Geographic Divisions

	Woolen System Spindles		Worsted System Spindles		Worsted Combs		Tow-to-Top Machines	
	Dec 1959 X 1000	Dec 1958 X 1000	Dec 1959 X 1000	Dec 1958 X 1000	Dec 1959	Dec 1958	Dec 1959	Dec 1958
U. S., Total	700	725	633	660	1,587	1,558	134	138
New England[1]	333	338	240	268	924	956	27	30
Middle Atlantic[2]	132	145	67	69	189	194	46	D
North Central[3]	54	58	9	D	D	D	D	D
South[4]	168	170	311	308	440	375	56	60
West[5]	13	15	6	D	D	D	D	D

[1]Me., N.H., Vt., Mass., R.I., and Conn.
[2]N.Y., N.J., and Pa.
[3]Ohio, Ill., Mich., Wis., Minn., Iowa, Mo.
[4]Md., Va., W. Va., N.C., S.C., Ga., Tenn., Tex., Miss., and Ala.
[5]Utah, Wash., Ore.
D—Withheld to avoid disclosing figures for individual companies.
Source: Bureau of the Census

network, American Cotton Manufacturers Institute, and Alabama Textile Manufacturers Association.

France Relaxes Hosiery Curbs. France has removed quantity restrictions on the importation of man-made fiber socks and stock-

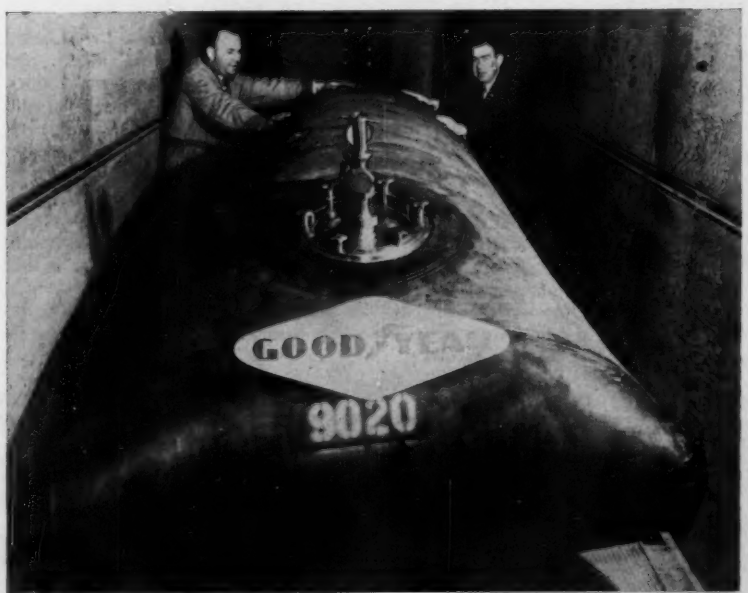
ings not over 20 denier in weight, and has reduced all duties by 10 per cent.

No More Hot Boxes. A pad-type lubricator for wheel bearings, developed with the cooperation of the School of Textiles at North Carolina State College, is designed as a replacement for cotton waste in railway journal boxes. The pad,

now in commercial production, is made of garnetted wool stock plus about five per cent cotton to hold it together. The pad is stitched around two pieces of foam rubber. It is said to improve on older wick devices by preventing the flattening which made waste-lubricators unreliable.

Wool Machinery Continues Decline. Machinery in place in U.S. woolen and worsted mills is continuing to decline, judging from reports of the Bureau of the Census. The number of woolen spindles dropped 3 per cent from December 31, 1958 to December 31, 1959, and the number of worsted spindles decreased 4 per cent during the same period. There are now 34 per cent fewer woolen spindles in place than in the middle of 1953, and 62 per cent fewer worsted spindles. Detailed figures for 1958 and 1959 are given in the table at the top of this page.

Textile Failures Edge Up. Textile mill failures numbered 39 in the first half of 1960, compared with 32 in the like period of 1959, reports the Credit Clearing House of Dun & Bradstreet, Inc. However, liabilities of the failed firms were about the same—$3,677,000 this year compared with $3,658,000 last year.



With this newly developed lightweight collapsible fabric container, virtually any highway truck, railroad car, or ship can be converted into a liquid-carrying conveyance within 15 minutes. Called Van Tanks, the containers can carry anything from printing ink to milk.

WARP DRAWING MACHINES HELP YOU KEEP AHEAD WITH FAST PATTERN CHANGES

Mills which are running fancy patterns, special weaves, short-order exclusives, or novelties are often bogged down waiting on drawing-in of new warps. The use of Barber-Colman Warp Drawing Machines can greatly relieve such situations because of the ease and rapidity with which new patterns can be drawn. Operating at speeds (depending on conditions) of from 2,000 to 5,000 ends per hour, these machines will draw cotton, worsted, wool, or filament and spun synthetics for plain or dobby weaves from a flat sheet, split sheet, double beam, or one-and-one leased warp. Correct selection of drop wire, heddle, and reed dent for each end is accurately controlled by a metal pattern strip punched in accordance with the designer's draft. Machines are made in several sizes with capacities up to 26 harness frames and 8 banks of drop wires. *For details, see your Barber-Colman representative . . .*

21st SOUTHERN TEXTILE EXPOSITION

GREENVILLE, S. C.
OCTOBER 3rd–7th
1960

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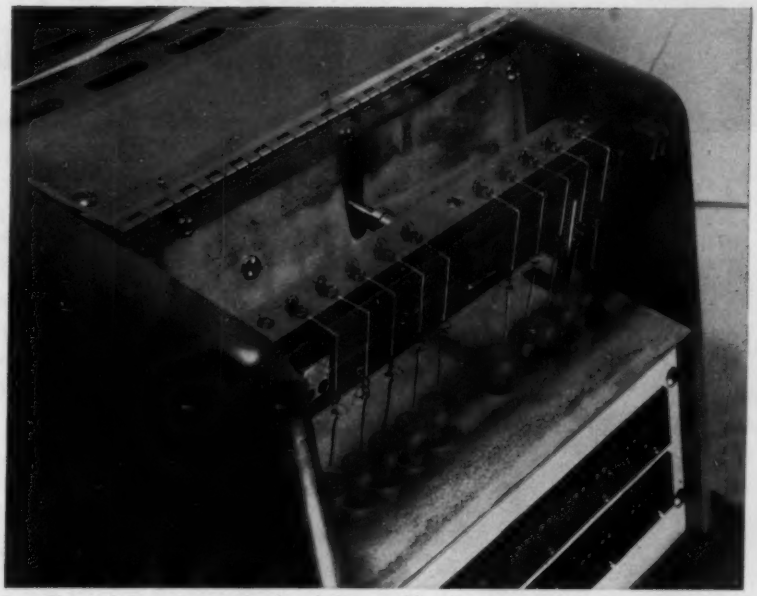
RECENT TECHNICAL AND COMMERCIAL DEVELOPMENTS

by J. B. Goldberg
Consultant to the Textile and Allied Industries

Exclusive



Dow Chemical Co. scientists developed this new fiber flex tester, which measures the wear resistance of up to 100 fibers as they are flexed over corner of a thin carbide bar. The bar has four edges of varying radii to permit selection of radius nearest that of fiber. The instrument is now commercially available. See page 202.

FIBERS AND YARNS

Acrylic Staple for Cotton Blends. It has been reported that the Dow Chemical Co. is planning to offer a type "C-1" Zefran acrylic staple designed for blending with cotton. The new staple is said to be a blend of deniers with an average size of two denier. (Du Pont introduced a Type 72 Orlon staple for similar purposes a few months ago.)

Spinning Jets for Unconventional Cross Sections. An English concern has developed means for producing shaped-aperture spinning jets in stainless steel alloys which have a long life and resist scratching. These unconventional jets permit spinning filaments of unusual cross sections to provide altered yarn and fabric characteristics.

High - Temperature - Resistant Fiber. The Du Pont Company is marketing a new crystalline low density fibrous material, "Tipersul," said to be a potassium titanate, with resistance to temperatures of up to 2200 F and having a low heat conductivity. The material is available as loose fibers, in lumps, blocks, sheets, and paper form made by standard felting techniques.

Modified Nylon. English scientists have described a technique for irradiating nylon fiber or fabric and grafting methacrylic acid to the nylon. The grafted product has a much lower electrical surface resistance and is insoluble in materials which normally are solvents for nylon, e.g., hot benzyl alcohol or formic acid.

Stabilized Yarns for Coated Fabrics. A German producer has developed a special low-shrink nylon or polyester yarn, said to be particularly suited for coated fabrics. The low shrinkage eliminates problems encountered when the woven fabrics are subsequently coated with rubber or vinyl compounds.

Improved Acrylic Fiber Process. The Von Kohorn International Corp. has reported development of a new patented fully continuous process for the polymerization and spinning of acrylic fibers. It is said that appreciable reductions in utility and labor costs are achieved, lowering production costs while at the same time yielding fibers with improved properties.

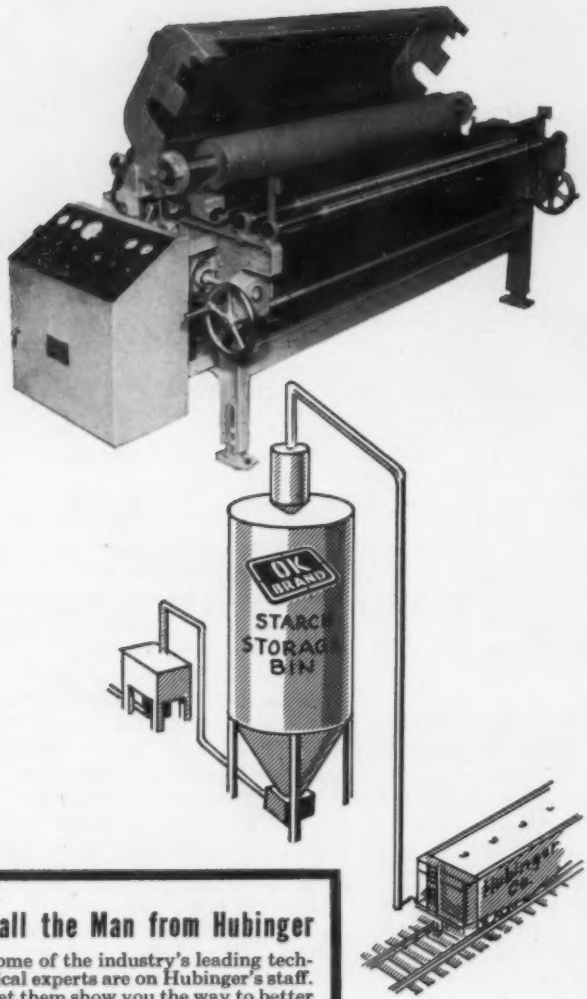
FABRICS AND FINISHES

Wash-and-Wear Fabrics. A New York chemical manufacturer is now marketing a new resin for cotton, rayon, and other fabrics which is said to permit the application of wash-wear finishes without yellowing, odor build-up, or strength loss. The product is low-priced and is said to have as a chemical basis, urea formaldehyde, and ethyl alcohol, with credit for the idea given to an article which appeared in a Japanese journal. * * * Joseph Bancroft & Sons Co. announced availability of a new Everglaze Ban-Care non-resinous finish for rayon fabrics, reported to provide wash-wear ratings of 4 to 5 by AATCC standard tests. Garments fabricated of these processed rayons are said to withstand as many as 50 repeated commercial launderings and can be washed and dried by any normal method at home or commercially with no ironing required. Dimensional stability is durable due to chemical conversion of the basic fiber composition, and fabrics retain a soft, pliable, non-irritating hand.

Dyes for Acrylic Fibers. A newly marketed group of acrylic fiber dyes is said to be effective through control of the number of positively charged dye sites of the individual dye molecule. Penetration is said to be rapid and need for a retarder is eliminated. Only com-

What you should know about STARCH*

YOU PROBABLY KNOW—BUT OTHERS MAY NOT



Q. What are the main causes of excessive shedding?

A. (1) Size not cooked sufficiently.

(2) Size mix too heavy or viscous.

(3) Size box temperature too low.

(4) Overdrying of warps.

(5) Not enough pressure on squeeze rolls.

(6) Improper dressing due to bad blankets or density of rubber squeeze rolls.

Q. What are the usual causes of soft warps?

A. If the trouble is continuous, the starch content of the size formula is probably too low; or too many ends are being put through one size box.

If the trouble is intermittent, one of the following could be the cause:

(1) Variation of starch content in size formula.

(2) Size foaming in size box.

(3) Too much agitation in storage kettle.

(4) Size mix prepared too far in advance of usage.

(5) Condensation of steam in size box.

(6) Using wet steam.

(7) Improper washing down of squeeze rolls.

(8) Slasher operating at slow speed.

Q. WHAT ARE THE BEST STARCHES AVAILABLE FOR SIZING COTTON AND SPUN SYNTHETIC WARPS?

A. OK BRAND STARCHES, of course, manufactured by THE HUBINGER COMPANY.

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THE HUBINGER COMPANY

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mon salt and acetic acid are required for even exhaust and level dyeing by conventional equipment.

All-Pima Towel. An all-pima cotton terry towel is being offered by Cannon Mills, Inc.

High-Pile Comforter. Princeton Knitting Mills is introducing a new comforter made with an acrylic high pile top and a jersey back and filling with Dacron polyester fiber.

Synthetic and Reconstituted Leathers. In England, Lantor, Ltd., has announced plans to produce a nonwoven synthetic leather. Applications are seen in leather, leather-cloth, and the plastics fields. (Earlier this year it was revealed that the Du Pont Co. was in the process of developing a leather-like synthetic product said to be designed especially for the shoe uppers trade). * * * In Japan a synthetic leather has been produced from nylon chips by a rubber concern. Two manufacturers of nonwoven fabrics also claim that they have produced similar materials and are prepared to supply them for use in footwear and other consumer products. It is reported that the strength of the nylon product is not as high as that of leather. * * * A "reconstituted" leather, under development by the United Shoe Machinery Corp. and Armour Leather Co., is expected to compete with vinyl films for use in luggage and upholstery, although the primary goal is for replacing leather in shoe uppers. The material is derived from substances in natural hides.

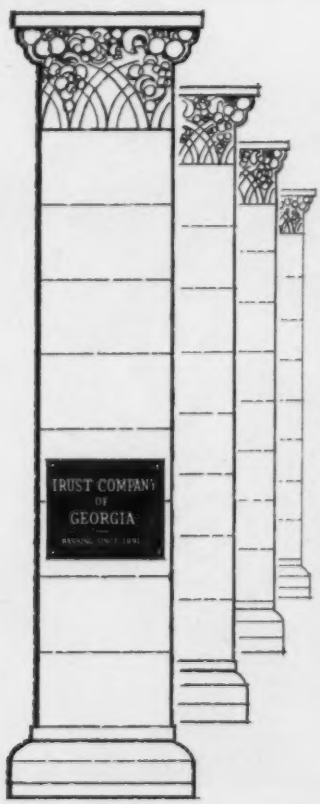
Wool Creasing and Felting. U. S. Department of Agriculture's Western Regional Research Laboratory reports development of a new process to produce permanent creases and pleats in wool fabrics, by treatment in a dilute solution of ethanolamine. * * * The same laboratory has announced a method for making wool felts denser and harder, by treating with a hot solution of dimethyl sulfoxide. Soft felts can reportedly be compacted to half their original size in minutes using this process, as compared to hours by present methods.

Single-Stage Diazo Process. Students at an English college are reported to have developed a single-stage process for the preparation of diazo salts, used in dye manufacture.

Mothproof Wrap. A New York packaging concern is marketing "Moth-Rap," a paper impregnated with a 0.5% solution of lindane. The wrapping is said to be effective in protecting clothing and other woolens against moth damage.

MACHINERY AND PROCESSES

Builder for Magazine. A southern firm is marketing an automatic spinning frame filling builder which it is claimed eliminates the necessity for rewinding filling for the Draper automatic filling magazine. *Continued on page 185*



PENSION and PROFIT-SHARING PLANS

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*Du Pont's registered trademark for its acrylic fiber. **Du Pont's registered trademark for its polyester fiber.

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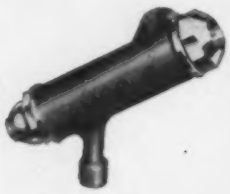
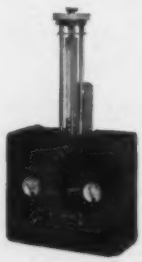
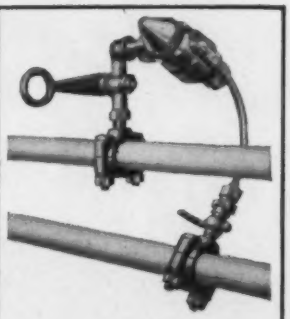


No. 6 Atomizer

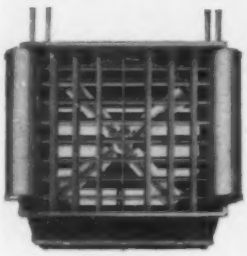
Atometer



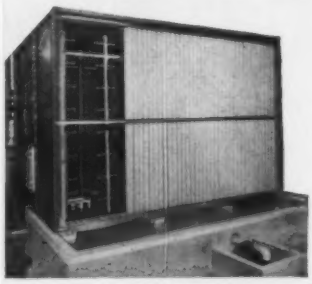
Humidity Control



Aeromizer

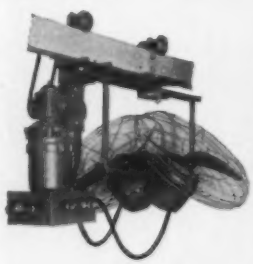


Evaporative Cooling Unit

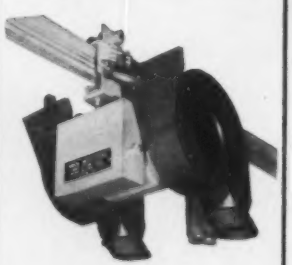


Air Washer

Modulating Interrupter



Ceiling Cleaner



Loom Cleaner

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EXECUTIVE VIEWS

Prepared by a man who is closely identified with the textile industry.

The woes of wash-and-wear

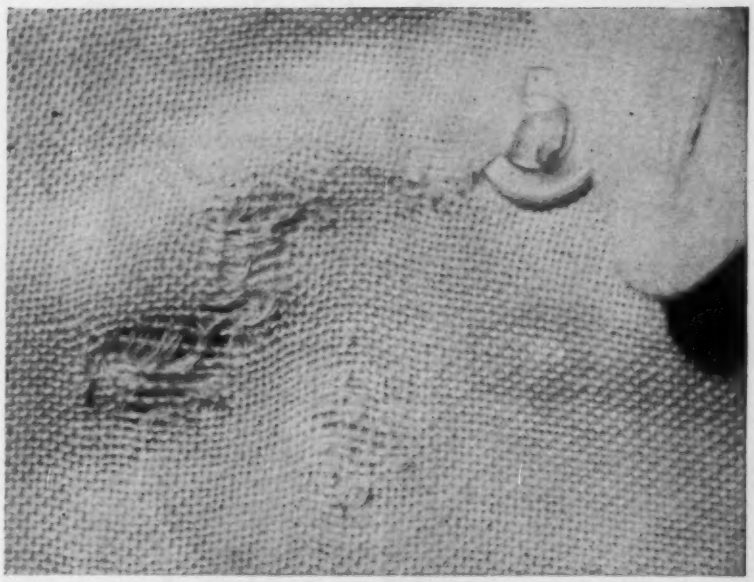
COTTON'S position in the present market for apparel fabrics rests primarily on the application of wash-and-wear finishes. It is not exaggerating to say that wash-and-wear salvaged cotton from a serious decline in its sales position a few years back.

But now cotton faces another crisis. Borderline operators, marginal promoters, and the fast-buck boys have moved in, and have done such a thorough job of destroying public confidence in wash-and-wear that unless corrective steps are taken, and taken soon, wash-and-wear may be washed up.

The situation has deteriorated to the point that unless industry-wide standards are adopted, cotton will very likely forfeit the easy-care market to the man-made fibers and their blends which give a truly natural wash-and-wear performance.

Many in the trade are convinced that voluntary standards for wash-and-wear fabrics and garments must be agreed upon and adhered to by mills, converters, cutters, and others concerned. If this isn't done, it is all too likely, they feel, that the government will step in and force adoption of standards, as happened in the case of the Textile Fiber Products Identification Act.

It was our privilege recently to attend a conference on wash-and-wear cottons, at which mill men, resin manufacturers, research people, and others let down their hair and spoke frankly on what they think has brought about the present sorry state of affairs. Here is an outline of some of the points they discussed:



Shrinkage. When wash-and-wear arrived on the scene, textile people were quick to learn that cotton fabrics could be stabilized with resins, rather than by the mechanical preshrinking processes which cost 3% to 12% or more of the off-loom yardage. As a matter of fact, this yardage gain in many cases more than pays for the resin application.

Now, there is nothing inherently wrong with this concept—but the resin must be permanent if the stabilization is to be permanent. But this won't be the case if the resin is shoddily applied, the amount of resin reduced to an absolute minimum, and with too rapid a cure made in the interest of increased production. These short-cuts, along with the use of cheap, unreliable resins, have produced a host of resin-treated goods

from which the resin vanishes after only a few washes.

After the resin is washed from the fabric, the shrinkage is the same as that of any nonstabilized fabric. The result in the garment is a gradual tightening of collar and waistband, shortening of sleeves, and so on.

Lack of Permanence. A wash-and-wear fabric is supposed to be reasonably wash-and-wear for the life of the garment. Too many garments are satisfactory after a wash or two, but lose their wash-and-wear characteristics after several washes. In these cases the resin produces an illusion of the body, drape, hand, and other characteristics associated with higher quality fabrics. But after washing removes the resin, there remains a limp, sleazy fabric.

Again, the cause is too much corner-cutting—inferior resins or too little resin, and insufficient curing time.

Permanent Wrinkles. In a substantial number of cases, fabrics which are supposed to be wrinkle-shedding are nearly the opposite. After tumble drying, these fabrics are so badly wrinkled as to have almost a crepe appearance. And the wrinkles are often practically impossible to remove, even with heavy ironing.

This condition comes about through improper selection of resins; sometimes by using a mixture of the so-called reactive resins and a surface-type resin, put into the fabric to produce a stiffening or hand-building effect. Since the surface-type resin is usually the cheapest component of a finish, there is a strong temptation to use it in excessive amounts; the result is the permanent wrinkling effect upon washing and drying.

Odor. Some wash-and-wear fabrics produce unpleasant odors, not only in the stores, but also in consumers' homes, sometimes after several washings. Most of the odors are the result of improper curing or improper afterwashing, again brought about by attempts to cut costs and increase production.

Odors may result from short-cut processes which eliminate the afterwash, and an afterwash has been found to be an indispensable part of resin finishing.

Discoloration. Yellowing is often a problem with substandard wash-and-wear fabrics, particularly whites. And the reason again is simple: cost-cutting by using an inferior resin.

White shirtings and sheetings are particularly susceptible to yellowing, and the discoloration can not be removed even by the application of strong bleaching agents. The only hope for these garments is a commercial laundry treatment, where the strong sour used removes the resin from the goods. Of course the garment is then no longer wash-and-wear.

Fading of Dyes. Wash-and-wear finishes are often applied to dyed fabrics without regard to the ultimate effect of the resin on the shade and permanency of the goods. Instances are common of different resins being used on different lots of the same shade, so that when a cutter inadvertently mixed the lots on his tables, differential fading made the gar-

Robert E. Pomeranz
President, Roberts Company
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ments unusable.

Improper resin selection is again the problem, coupled with cost-cutting by the use of cheap resins and cheap dyes. There is no excuse for using resins and dyes which are incompatible; both dyestuff and resin manufacturers have done much research on this subject, and the information they have found can be had with no effort. Mixing incompatible dyes and resins is either deliberate fraud or indefensible ignorance.

Soiling and Dinginess. There have been a legion of complaints that resin-treated cottons tend to soil more rapidly than untreated fabrics. This is especially true of such garments as men's shirts, where there is more than ordinary wear at such areas as collars and cuffs. This is believed to result from the fact that fabrics are more easily abraded after resin treatment, and that abraded areas pick up and hold soil more readily.

Many wash-and-wear fabrics are also treated with a softening agent, applied primarily to overcome some of the degrading effect of the resin finish. Often these agents are applied without regard to soiling tendencies, with the result that the wash-and-wear garment becomes unusable after a few washes.

Poor Wear. This covers a multitude of sins, and may include most of the problems already outlined. In general, however, it refers to the greater tendency of the resin-treated fabric to tear, rip, wear out, and become scuffed. These are often the results of improper resin cure or the use of the wrong catalysts, but may even include cost-cutting by skimping on the quantity of softener used.

Wash-and-wear has reached a crisis. There are indications that even more shoddy practices are becoming common, and that many reliable and well-established textile houses are being forced to adopt shady cost-cutting practices and sloppy production methods to meet the pressure of competition from marginal operators.

The situation is serious, and demands thought, study, and action by all those concerned with the future of wash-and-wear.

FUTURE EVENTS

Date		Event	Location
Sept.	7-8	Canadian Textile Seminar	Queen's University Kingston (Ont.), Canada
	8-9	Combed Yarn Spinners Association	The Cloister Sea Island, Ga.
	8-9	Textile Quality Control Association	Clemson House Clemson, S. C.
	9	Northern New England Section AATCC	Wachusett Country Club West Boylston, Mass.
	10	Southeastern Section AATCC	Atlanta Athletic Club Atlanta, Ga.
	10	South Central Section AATCC	Hotel Patten Chattanooga, Tenn.
	14-17	Southeastern Maintenance & Engineering Show	State Fair Arena Raleigh, N. C.
	15-16	Textile Processing Symposium, American Gas Association	Sedgefield Inn Greensboro, N. C.
	15-16	Chattanooga Yarn Association outing	The Read House Chattanooga, Tenn.
	17	Southern Textile Overseers Association family meeting	Greenwood, S. C.
	17	South Central Section AATCC	Andrew Jackson Hotel Knoxville, Tenn.
	17-21	National Safety Congress	Conrad Hilton Chicago, Ill.
	18-19	Institute of Textile Technology technical advisory committee and board of trustees	I.T.T. Charlottesville, Va.
	22-23	First International Textile Dyestuffs, Finishes, and Auxiliaries Exhibition	Free Trade Hall Manchester, England
	22-23	Southern Textile Methods & Standards Association	Clemson House Clemson, S. C.
	23	Western New England Section AATCC	Blake's Restaurant Springfield, Mass.
	23-24	Piedmont Section AATCC	Hotel Charlotte Charlotte, N. C.
	28-30	North Carolina Textile Manufacturers Association meeting	The Carolina Pinehurst, N. C.
	28-29	Chemical Finishing Conference	Statler Hotel Washington, D. C.
Oct.	3-7	Southern Textile Exposition	Textile Hall Greenville, S. C.
	6-8	AATCC national convention	Sheraton Hotel Philadelphia, Pa.
	7	Southern Textile Overseers Association annual meeting	Hotel Greenville Greenville, S. C.
	12	Tufted Textile Manufacturers Association annual workshop	Hotel Patten Chattanooga, Tenn.
	13-14	National Industrial Engineering and Management Clinic, sponsored by Industrial Management Society	Conrad Hilton Hotel Chicago, Ill.
	19-22	Carded Yarn Association annual meeting	Grove Park Inn Asheville, N. C.
	22	Textile Operating Executives of Georgia slashing and weaving discussion	Georgia Tech Atlanta, Ga.
	22	Alabama Textile Education Foundation	Auburn University Auburn, Ala.
	27-28	The Fiber Society	Washington Hotel Washington, D. C.
Nov.	12	Textile Education Foundation Inc.	Georgia Tech Atlanta, Ga.
	12	Alabama Textile Operating Executives carding and spinning discussion	Thach Auditorium Auburn, Ala.
		1961	
Mar.	23-25	American Cotton Manufacturers Institute annual meeting	Fontainebleau Hotel Miami Beach, Fla.
April	12-14	Alabama Textile Manufacturers Association annual meeting	Beuna Vista Hotel Biloxi, Miss.
	24-28	Knitting Arts Exhibition	The Auditorium Atlantic City, N. J.
	26-29	Georgia Textile Manufacturers Association annual meeting	Hollywood Beach Hotel Hollywood, Fla.

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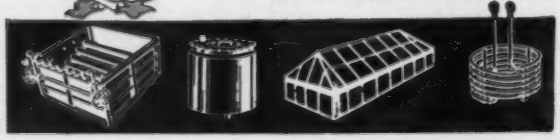

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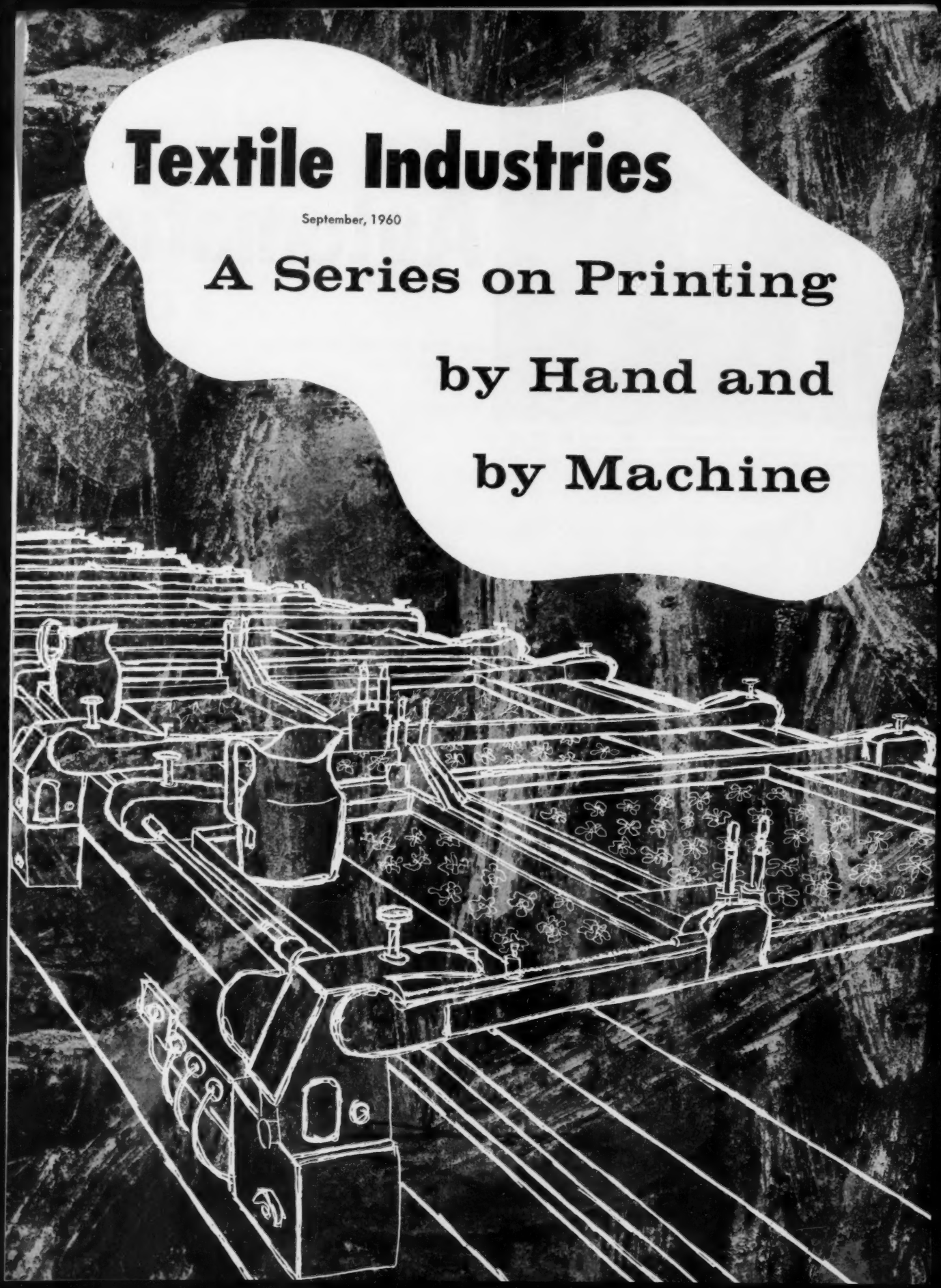
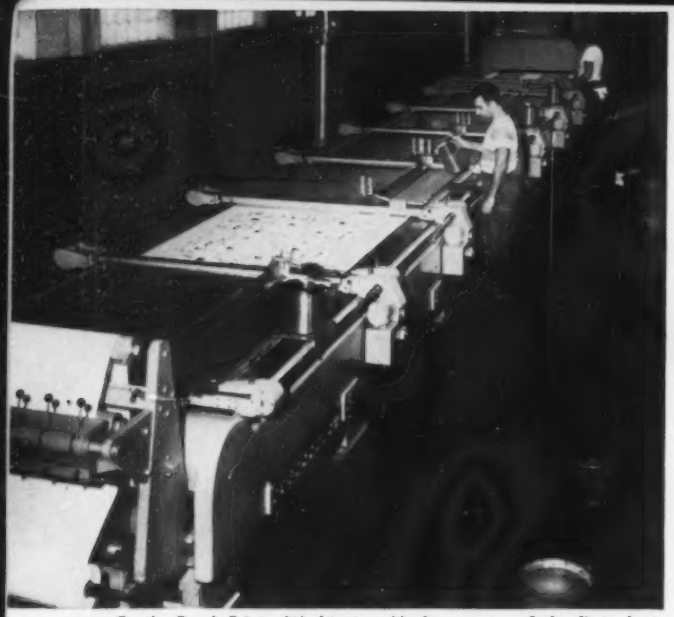




Castle Creek Prints, Washington, N. J., was one of the first plants in this country to install automatic screen printing. The Buser machine shown above was photographed in the early 1950's.

Automatic

by Stanley M. Suchecki
Associate Editor

Exclusive

DURING the last decade, printing production in the United States has been maintained at an annual level of more than 2 billion yards, accounting for better than 20% of the entire finished fabric production. It is anticipated that this volume of printing, which does not include a growing production of printed knit goods, will continue into the foreseeable future.

Without question, the roller printing industry has been accounting for the largest share of the volume, for the intaglio roller machine is without equal as a unit of high productivity. Although the number of printing machines has declined to about 393, from about 500 ten years ago, the productive potential of the industry remains an enormous one.

Of much smaller economic significance are the hand and automatic screen printing operations, which account for less than 5% of total printed volume, or in the neighborhood of 75,000,000 to 100,000,000 yards. Of still less importance, both in number of units and in productivity, is surface printing by machine; and lastly, the specialized flock printing operation fills an even smaller demand.

Stylists who have a working knowledge of roller and hand screen printing will acknowledge that the latter offers more freedom for artistic expression. And its low production rate works to advantage, for by limiting the yardage of a design, it lends it an exclusive value. By contrast, styling for roller printing is governed by a fixed machine design, which limits the number of colors as pattern size increases. And a strict law of economics demands higher yardages to offset high initial costs. Moreover, the multiple crushing action of rollers reduces color bloom, while the lack of pressure in screen printing enhances it.

For these reasons, it is not surprising that attempts should have been made to automate hand screen printing. For industry is inherently motivated to mechanize those hand methods which are sound in principle, and whose products offer potentially greater markets. This has been true of the development of intaglio roller printing, which is a mechanization of hand block printing, and it is now in evidence with the increasing acceptance of automatic screen printing, which became a commercial reality in Austria in about 1940, and appeared in the U. S. as an importation in 1950.

Automatic Screen Printing in the U.S. In this country there are now in operation about 30 machines of various makes, producing an annual volume for the drapery, decorative, and dress fabric markets estimated at between 20,000,000 and 40,000,000 yards. Moreover, the list of machine owners is now beginning to include roller printers. As a group, they are traditionally bound to the belief that no printing development could approach the soundness, versatility, and productivity an operation that has not changed in principle in more than 175 years. Of course, automatic screen printing has not fully met these requirements. But on the other hand, it has not yet reached its full potential. At any rate, roller printers are giving it a harder look in view of trends toward shorter runs and the consequent need for more economical printing methods.

Outside the United States, the growth of automatic screen printing has been quite phenomenal, as the accompanying chart (pages 117 to 124) reveals. In Japan, for example, there are reportedly more than 65 installations of the Ichinose make—not to mention machines of other makes—which produce for export alone about 6,000,000 yards each month.

No doubt the concept of automating hand screen printing had occurred to printers and machine builders long before 1940. But the problems that this relatively simple operation posed were not overcome by earlier engineering attempts, which reflected crude principles in design, resulting in

screen printing

So far it has cut heavily into hand screen printing and it is not a threat to roller printing. But the trend to smaller-yardage lots is bringing roller printers into the field; they are also attracted by its high-style possibilities

poor accuracy of printing, or as screen printers refer to it, poor accuracy of register. Oddly enough, no startling breakthrough in the science of engineering was called for to achieve the all-important accuracy of register. Its achievement came about, instead, through the perseverance of engineering talents dedicated toward building machines of high precision.

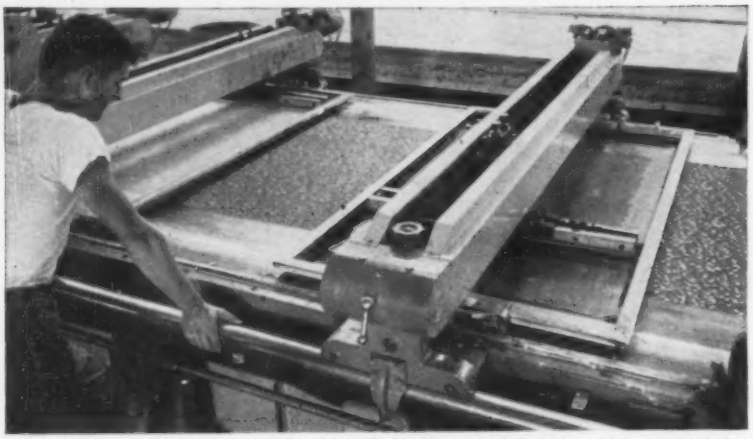
In the machine chart accompanying these pages, seven machines of commercial importance in the U. S. are briefly described. For lack of space, only sketchy descriptions could be given of the design and operation of those mechanisms, which are vital to accurate printing and uninterrupted machine performance. A fuller explanation of how each manufacturer has overcome the common problems would have entailed exhaustive research beyond the scope of this article. The sole purpose of the chart was simply to list the salient features of each machine and thereby point up differences, if they should exist, which are of interest to screen and roller printers.

Principles of Automatic Screen Printing. On principle of operation, at least, there is complete agreement among the machine manufacturers. Each machine utilizes an endless conveyor as a printing blanket, which is arranged with a dryer for operation as a unit. And printing on all machines follows an identical cycle: (1) Advancement of conveyor the length of a repeat, (2) lowering of screens, (3) printing—movement of squeegees across screens, and (4) raising of screens for resumption of cycle.

At this point, mention might be made of a commercial machine which is based on an entirely different principle of operation. It uses rotary screens and thus enables continuous rather than intermittent operation. To what extent this machine is being used, however, could not be learned.

Apart from the principle of utilizing an endless conveyor and the need for a printing cycle, the machines reflect some differences in viewpoints on how best to accomplish certain functions. It is interesting to note that some contrasting views are held on the selection of substances and their use as squeegees. To be sure, a wide use is made of rubber. And some manufacturers offer a selection of basic squeegees which are not altogether dissimilar in profile and degree of hardness. But two manufacturers resort to metal alloys for use as squeegees, which are infinitely harder, and for that matter, inflexible. Both of these manufacturers, incidentally, make use of the roller squeegee. In one case, however, it is only one of the

Stonehenge Processing Corp., Cedar Grove, N. J., was the first automatic screen printing plant in the United States. The firm now has three Buser machines.



Gsell Textile Printing & Finishing Co., Newark, N. J., entered the automatic screen printing field three years ago, although it still does a sizeable quantity of screen printing on tables. The Comerio Ercole machine shown here is equipped with hot-air blowers, used whenever a pattern calls for sharper outlines. The firm specializes in printing and finishing woven and knitted dress fabrics and beachwear for the high quality markets.

basic squeegee profiles, while in the other it must be used for all purposes, though it is available in various diameters. These differences in profiles and in composition of squeegees are evidently of no practical consequence. They simply reflect individual manufacturer's preferences.

At least one other related difference is apparent from a study of the machines. This has to do with the hardness of printing surface in relation to hardness of squeegee, or vice versa. While one manufacturer adheres to the principle of a hard squeegee working on a relatively hard surface, another shows preference for a soft squeegee working on a hard surface. And a third takes still another view, in which a hard squeegee works on a soft surface. Among other manufacturers, however, hardness characteristics of printing surface and squeegee are less clearly defined, and various combinations are possible.

Of what practical significance these contrasting views may be it is difficult to determine, for regardless of the concept that each manufacturer adheres to, presumably identical printed effects can be achieved on all machines by proper use of tools and equipment, and by modification of printing conditions. Nevertheless, the speculation is raised that the automatic screen printing machine of the future might embody a principle of color application quite remote from present day practices, which utilize traditional concepts, materials, and techniques. There is some small evidence that new trends are now in evolution.

Higher Speeds and Lower Setting-Up Time. A discussion of automatic screen printing must inevitably lead to a discussion of machine productivity, for automatic screen printing is a growing development which already has slightly encroached upon roller printing markets. Not surprisingly, a study shows that improvements in machine speeds have been forthcoming steadily, and without loss of printing accuracy. But output in terms of yardages per hour is not influenced alone by machine speed—or by shorter printing cycles. It is influenced by size of pattern and by number of squeegee strokes required. Of course, a higher number of squeegee strokes results in a longer printing cycle, which in turn reduces output. The factors which influence production rate might best be illustrated by citing the claimed hourly production of a popular make of machine.

For a repeat of 40 inches, requiring one stroke of the squeegee, the theoretical production in yards per hour is about 800; while for the same repeat, requiring two strokes of the squeegee, it drops to about 500 yards per hour.

For a repeat of 20 inches, requiring one stroke, the theoretical production drops even more, down to about 400 yards per hour; and for the same repeat, requiring two strokes of the squeegee, it falls to about 250 yards per hour.

While these figures do not represent the theoretical hourly production rates of every other make of machine, they are indicative of top operating speeds in the field, as brought out in the course of this survey. They also serve to point out, to those outside the screen printing field, the factors which directly influence hourly production rates.

The daily, weekly, and monthly output per machine, however, is quite another matter. It is influenced by size of orders, and hence by number of pattern changes; and above all, by the competence of plant management in organizing a team dedicated to the job of "keeping the machine running." This calls for a preventive maintenance program, and particularly for highly qualified maintenance personnel, for skillful color matching, and for a day to day uniformity in fabric preparation. For it is conceivable that for shorter yardages, the time required for setting up patterns and for matching shades could equal, if not exceed, actual running time.

This brings up a point of considerable importance in any appraisal of automatic screen printing machines; that is, setting-up time. The machine manufacturers are aware that this can be expensive and hence they strive to develop devices for fastening screens securely in the shortest possible time.

As is well known, automation of the hand screen process has also introduced technical problems. Generally, printing is done "wet on wet," which means that screens rest directly on previously printed, wet colors. This calls for accuracy of register, which is a built-in quality of the machine; for a fabric of high absorbency; and for a carefully formulated color paste. If these are lacking, poor quality is the inevitable result. Poor accuracy of register will cause the pattern to go out of fit, and will make fine lines fuzzy. If the color is not absorbed sufficiently, the screens will transfer it to other areas of the fabric.

Automatic screen printing poses still another problem, which is a threat to profits. If poor quality printing is not detected shortly, it can amount to a sizable dollar sum. Therefore, it calls for operator alertness—in contrast to screen printing on table, where a much slower rate of production, and even a leisurely inspection favor quality printing.

While the hourly production rate of a machine is less meaningful than at first supposed, the trend in the industry is, nevertheless, toward a higher hourly output. Most important in achieving higher speeds over the years has been the trend toward the use of hydraulic power. A study of the machine chart will reveal the varying degrees of its application.

A study will also reveal that steps have been taken to shorten the printing cycle. Some manufacturers, for example, indicate that only one stroke of the squeegee is necessary for all printing purposes; and one manufacturer has arranged for partial lowering of the screens to coincide with conveyor advance; while another points out that on his machine the screens are raised only half an inch. Even the mills show a preference for a shorter number of squeegee strokes. Some plants make it a standard practice not to exceed two strokes. Among the mills, too, there is an established trend to operate on a two-shift basis for a more rapid return on a large investment.

Before leaving this discussion on differences in machine characteristics as they pertain to output of machine, it is important to realize that the machine manufacturers had a definite goal in mind when designing their machines. Some manufacturers emphasize a high production rate, others stress quality printing, while some try to build a versatile machine to achieve both goals. Hence, the machines vary in degree of complexity.

It is expected, however, that manufacturers will strive to increase speeds. In doing so, drying equipment of much greater efficiency will be required. And there will be need for screens of better quality and longer life.

History and Projected Growth. In preceding pages, we have tried to describe the governing principle of automatic screen printing and to point out the approaches taken to make it a sound, efficient, and economical operation. As a process it is more complex, and technically more demanding than hand screen printing. But it offers high productivity in a smaller working area at a reduced labor cost. Though it is mechanically a sound development, further improvements in machine design and in operating speeds are coming along steadily. Its growth seems to be assured.

But there is no longer doubt about growth. The questions that automatic screen printing is beginning to raise are these: How far can it go? Will it continue to penetrate the quality roller printing markets?

The answers, as yet, cannot be clearly seen in the short history and development of automatic screen printing. Besides, as a unit of production, the automatic screen printing machine cannot compete with the high production rate of the roller printing machine. Its principle of intermittent operation, which is dictated by machine design, does not offer maximum output when patterns are of short repeat—in the range that is most common in roller printing.

Although the answers to these questions are uncertain at this time, inasmuch as there are comparatively few machines in operation, the tendency to conjecture about growth is becoming widespread, extending even to the roller printers themselves, who acknowledge the economic advantages of automatic screen printing for shorter runs.

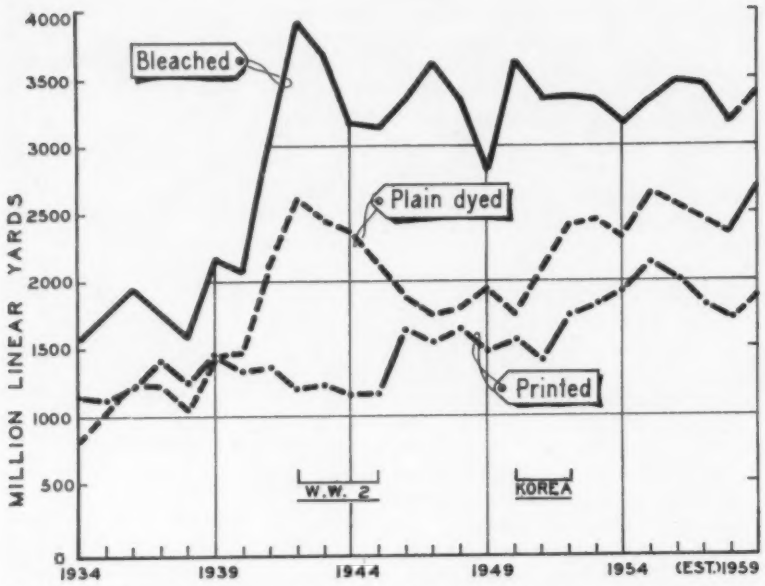
Some projection of growth might also be indicated from a brief historical review of the industry in this country. How had it begun? Who are some of its operators? Are they progressive?

Not surprisingly, the first automatic screen printing plant was started by a group of men with experience in the drapery and upholstery markets, where the screen print is a popular item. This small group was headed by Douglas Hardy, an engineer by training, who foresaw a brilliant future for automatic screen printing not many years after it had gained a prominent place in European markets. After placing an order in 1947 for a machine of European make, he set out to build a modern, one-story plant in Cedar Grove, N. J., to be known as Stonehenge Processing Corp. In 1950, the company went into production.

Some risks were involved in this venture. Aside from the fact that automatic screen printing was a relatively new process, as yet untried in this country, and would require practical experimentation, Stonehenge also plunged into another new process—flash aging of vats. This process was not actually new. But at the time it was just emerging from laboratory stages. If successful, it would lend itself well to screen printing, because prints could be stored indefinitely, and a wider range of vats of excellent color yield and fastness could be utilized.

In its early months of operation, Stonehenge concentrated on developing printing and color application processes. In time, the plant overcame the problems inherent in "wet on wet" printing, and worked out the "bugs" in the flash aging process. Within a year of its founding, another machine of the Buser type was purchased. Then, the company's growth began to present problems in space. In less than 10 years, the original structure was found to be inadequate to house an expanding productive capacity. Accordingly, a second story was added to a portion of the plant to make room for a third Buser machine. Simultaneously, management streamlined its aging and soaping operations for a more efficient production flow.

Stonehenge's history, which is marked by frequent modernization and expansion, is not unique in the field. The history of at least one other plant is similar—Castle Creek Prints, of Washington, N. J. This is an up-to-date plant in every respect, in equipment and in technologies. Its owner, Frank Percarpio, is also an early pioneer of automatic screen printing, having entered the field in the early 1950's. Mr. Percarpio has modernized his printing plant almost every other year. Today, Castle Creek has in operation three ma-



U. S. production of broad woven fabrics—bleached, plain dyed, and printed. In the period 1954-1958, printed fabrics accounted for 25 per cent of total finished goods production. (Chart prepared by National Association of Finishers of Textile Fabrics.)

chines of the Buser type, which can print up to 8 colors each, and is now installing an 80-inch Buser of 12-color size. Thus far, Mr. Percarpio has purchased five machines (one early model has been sold) which represent an investment in round figures of $450,000.

Castle Creek's production reaches 4 million yards a year. It includes draperies, table cloths, and some specialty dress goods. The fabric range is almost unlimited, including cotton, glass, linen, Dacron, blends of rayon and cotton, blends of linen and cotton, and blends of Dacron and cotton. The plant accepts orders of 250 yards and up. On orders between 751 and 1,000 yards, a normal pricing arrangement applies. But on orders of 250-500 yards, and 501-750 yards, extra charges are applied.

Mr. Percarpio estimates that between 32 and 40 hand screen tables, of 80 yards each, would be required to meet his present production, indicating the tremendous reduction in plant size and space that automatic screen printing affords.

His views on the automatic screen printing field, based on almost 10 years of operation, indicate the progressive character of the field, and of his own company. "Automatic screen printing," he points out, "has become a business requiring large investment. We are continually modernizing. And for rapid return, the machines require a competent maintenance staff, including an electrical maintenance man, to keep them in running condition."

Advantages of Automatic Screen Printing. The favorable position of automatic screen printing can be chiefly attributed to its soundness as an operation, to its economics and to lack of restrictions on pattern length and number of colors. But as a unit of production it only begins to approach roller printing when pattern lengths are well beyond the normal limits of roller printing. For a repeat of 50 inches, for example, requiring one stroke of the squeegee, the theoretical production rate reaches 1,000 yards per hour, to compare favorably only with the lower speed range of roller printing.

At this stage, a comparison of the two methods would only reveal that they can co-exist. Nevertheless, the advantages of automatic screen printing are well worth reviewing. To begin with, initial costs of printing are lower. The cost of a screen is about $60.00, while the cost of an engraved roller for a dress goods pattern is about $125.00. When this low cost is taken together with a lower labor cost—no high skills are required—and a shorter setting-up time, automatic screen printing becomes attractive for sampling, or even for the "high fashion" markets.

Critics of automatic screen printing now point out that styling for the screen has its limitations. They point out that blotches present problems, that fine lines and halftones are difficult to reproduce, and that stripes are impractical to print by screen. These are valid criticisms, but they will not forever apply.

It is true that blotches present problems because of the fixed principle of printing by screen. And though stripes cannot be printed by screen they can be printed nevertheless by a special apparatus. At least one plant, Castle Creek Prints, reports on this development and on the progress in printing fine lines by improvements in color paste formulations.

For the time being, however, automatic screen printing must be content to hold onto its present markets, which have been carried over from hand screen printing. With an increase in the number of automatic screen printing machines, however, competition should stimulate a wider scope of printing, and thus take it into other printing fields where there is need for more economical methods of printing.

It must be recognized that even outstanding achievements in roller engraving or roller printing are not always appreciated by the consumer, who has far less knowledge of what these require in training and in experience. Hence, printing results are not viewed with the prejudices of engravers and printers.

Roller printers must recognize, on the other hand, that even though the volume of automatic screen printing is only a small fraction of their output, it offers the consumer a styling which is normally impracticable to achieve on the roller machine. Besides, the screen printed fabric has an exclusive value and it will be available as time goes on at a decreasing cost.

FLASH AGING

by R. D. Greene
Technical Service
Dyestuff Department
American Cyanamid Co.

Exclusive

WITH THE rapid expansion of screen printing, the demand for vat color printing exhibited a corresponding increase. Many printers undertook to deliver vat prints but immediately ran into several obstacles to successful commercial production.

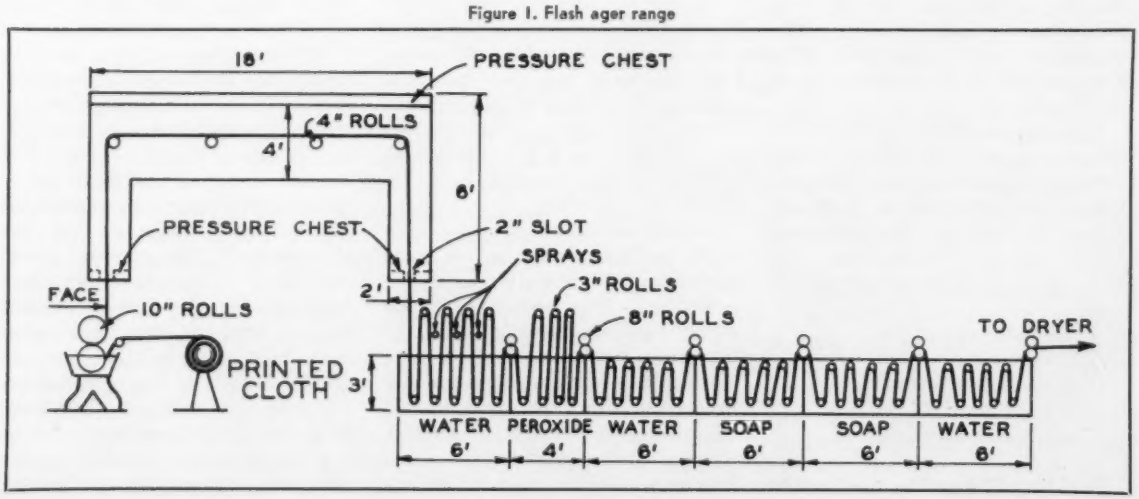
Aging by the use of conventional vat agers was quickly found to be unsatisfactory. The moist steam conditions essential to good color development coupled with the heavy layer of print paste deposited by the screen print process led to serious difficulties of marking off on the ager rolls. The tower ager was evolved to overcome this problem and production, though slow, was adequate to keep pace with the printing.

Further difficulties were experienced with vat color printing due to the uncertain stability of the sulfoxylate used in the print color. On many designs the interval between the application of the first color and the completion of the entire design was so great that decomposition of the sulfoxylate was often great enough to cause a serious loss in color development. Compensation for such losses was not practicable; it was usually irregular, depending on the time elapsed between printing and final drying. The long slow drying by hanging in the air accentuated the problem, particularly in the summer months when more humid atmospheric conditions were prevalent and buildings were not heated.

These factors slowed the development of vat printing by the screen process until a solution was found in the "flash aging" procedure. This method was developed in Germany by I. G. Farbenindustrie, and a bulletin was issued describing the "Colloresin" process in 1927. The process received little attention in the United States until much later when screen printers examined it as a possible answer to their problems in vat printing which it ultimately proved to be.

Flash Aging. The flash aging process consists of printing vat colors without the alkali and reducing agents normally incorporated in the print paste and padding these chemicals on the printed goods immediately before aging. The danger of sulfoxylate decomposition is overcome and goods may be printed and held for aging at any convenient time with-

Figure 1. Flash ager range



out the risk of color failure. This process is, of course, useful only for printing on white or undischargeable grounds as the chemicals are applied over the entire fabric.

Flash aging may be carried out in either of two ways: The printed goods are padded with the usual sulfoxylate and alkali carbonate, dried, and aged in the tower ager for 7 to 10 minutes. This procedure overcomes the difficulty of premature decomposition of the sulfoxylate, as the goods are dried immediately after padding. The padded goods may also pass directly into the ager without intermediate drying, using ager temperatures of 230 to 240 F to accelerate the heating of the fabrics to the level required for activating the sulfoxylate.

These procedures require the full time, 7 to 10 minutes, for aging and adequate tower aging capacity to handle print production at this slow pace. By either method the fabric is dry enough after aging to be collected in boxes before oxidizing and does not require a washer in series with the ager. In addition, samples may be developed before oxidation and soaping and any deficiencies in fixation corrected by repadding and reaging.

An alternate procedure which has found the wider acceptance consists of padding the prints with alkali and sodium hydrosulfite, passing immediately into the ager without intermediate drying, and continuing through the oxidation and washing apparatus. As color fixation is accomplished in 10 to 30 seconds, such a range can operate at much higher speed. The arrangement of machines is shown in *Figure 1*.

The success of this process depends on proper control of several factors, mechanical and chemical, which are adjusted to suit the fabric, the design, the dyes, and other individual conditions. The most vital of these considerations are:

The padder operation
The ager construction
The oxidation process
The printing vehicle
The padding solution

Padding. The padder need not be of extremely heavy construction, as only moderate pressure is required. Excessive nip pressure often results in marking off on the roll touching the face of the print and repeating back on the goods. Arrangements of doctors or brushes may be set up to keep the roll surface clean if this difficulty persists.

Two rubber rolls or one rubber and one metal roll may be used. A very satisfactory arrangement is shown in *Figure 2*.

The rubber-covered roll dips in the padding solution. The pad box is constructed with close clearance so that a minimum volume of padding solution is maintained. The solution is thus replaced at a rapid rate, avoiding contamination by small amounts of color coming off the prints and staining the ground. Fresh solution is constantly fed in across the entire width of the padder through a perforated pipe.

The padder is threaded up so that the face is exposed to the solution and comes in contact with the metal roll at the nip. The tendency to mark off is reduced by the smooth surface, which can in any event be readily cleaned on the other side of the padder by doctor or brush devices.

The padder is located directly under the ager as close as possible to reduce the oxidation of the hydrosulfite by air to a minimum. This distance is not extremely critical when running heavy or even average-weight fabrics, but in the case of sheer goods the hydrosulfite may be entirely lost by a few seconds exposure to the air. In some cases of less absorbent fabrics heavily printed with overlaid colors, a full dip into the padding solution may be required. In this case a small roll is installed on the pad box and a horizontal padder is conveniently used, as shown in *Figure 3*.

Padder pressure is regulated to apply sufficient solution for color development w i t h o u t excessive saturation. The presence of too much padding solution leads to bleeding of color beyond the outlines of the pattern during aging, detracting from the sharpness of the print and staining the ground. Control of the application of solution by using an engraved stipple roll has been proposed but has not enjoyed much favor because of the difficulty of applying the proper amount to both plain and overlaid portions of the designs. The wide variety of fabrics encountered also requires a variety of engravings to obtain the desired pick-up on the prints.

Aging. The ager for the hydrosulfite process is constructed so that the face of the printed goods does not touch anywhere during the passage through the ager. It may take the form of a straight horizontal chamber, a vertical tower, or a combination shaped like an inverted "U." The two latter are usually preferred because the entrance slot can be placed down close to the padder. This type of construction at the same time guards against the introduction of air drafts through the mouthpiece.

The top of the ager and the entrance and exit slots are built as pressure vessels or otherwise heated to insure against condensation drops. The carrier rolls inside the box are partially or wholly driven to avoid build-up of excessive tension.

The ager is located in relation to the padder so that the wet fabric passes directly into the steam without touching the sides of the slot. At the exit end the goods pass directly down through water to the first bottom roll in the washer.

Steam is introduced into the ager by perforated pipes fed by a high-pressure supply line. Auxiliary heating is provided to obtain the desired temperature.

The dimensions of the ager are determined by the available space, operating temperature, and desired production speed. As an example, an inverted U ager with 6-ft vertical legs and an 18-ft top is operated at 30 yards per minute at 225 to 230 F, giving an aging time of 20 seconds. The pressure vessel roof and slots maintain this temperature. For heavier goods, higher temperatures from auxiliary heat or longer time through greater length or slower speed are required. The cold wet fabric must be heated to the reaction and dyeing temperatures quickly before spreading out of the dye begins.

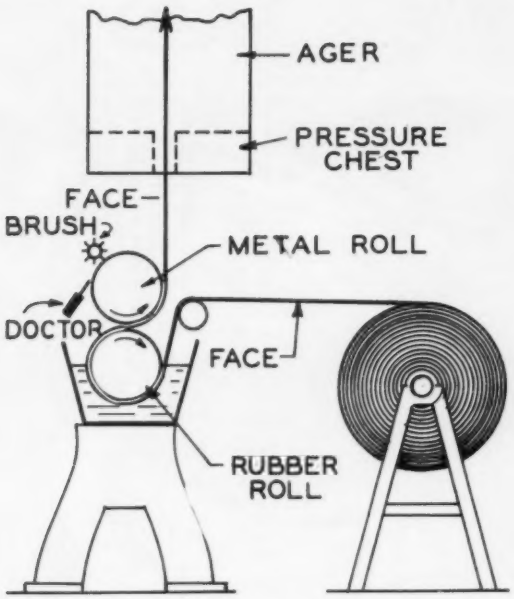


Figure 2. Padder

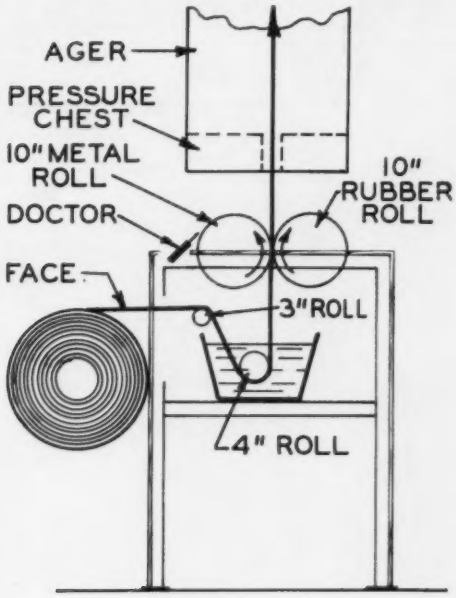


Figure 3. Horizontal padder

The various factors influencing the results vary greatly in different plants and no precise set of conditions can be recommended. Recent trends have been to increase aging capacity through larger agers and higher temperatures as the increased production from automatic screen printing machines demands. Where flash aging has been adopted in roller printing plants, the higher production speeds are a necessity for economical operation.

Oxidation and Washing. Upon leaving the ager the goods pass directly into an open-width washer, the face of the print touching the bottom roll of the first box, the first point since leaving the padder. This first box usually contains cold water. The upper rolls are elevated to increase the duration of the rinse. Sprays may be added to provide additional action. In some cases it has been found advantageous to have the cloth enter directly into oxidizing solutions, but the usual practice is to rinse off as much as possible of the chemicals with cold water before completing the oxidation by chemical means.

The second compartment of the washer holds an oxidizing bath. Hydrogen peroxide is usually used, since it provides rapid action and bright shades. Acetic acid is fed in along with the peroxide to regulate the activity of the bath. The carry-over of alkali from the fabric may cause the peroxide to react too vigorously and spend itself unless slowed down by the acid feed. In this bath the upper rolls are again elevated to provide a longer time of treatment without excessive bath volume.

After a thorough rinsing the goods are soaped vigorously to develop the true shade and fastness of the dyes. This may be done in succeeding compartments of the washer or the goods may be collected in trucks for completion of the soaping in other equipment.

Printing. The choice of printing thickener is important to the overall success of the flash aging process. The carrier for the vat dye must possess the following essential properties:

Low solids content
Sharp mark
Good flow
High color yield
Non-spreading in the ager
Easy removal in washing

The original recommendations of I. G. Farbenindustrie of starch and methyl cellulose and starch have been largely displaced by specially developed thickeners. In this field, Polymer Industries, Inc., has pioneered with several modified locust bean gums which are widely used. Du Pont has developed an emulsion carrier described in their "Savagraph" process. These and other variations are adapted to the conditions prevailing in individual plants to achieve satisfactory performance.

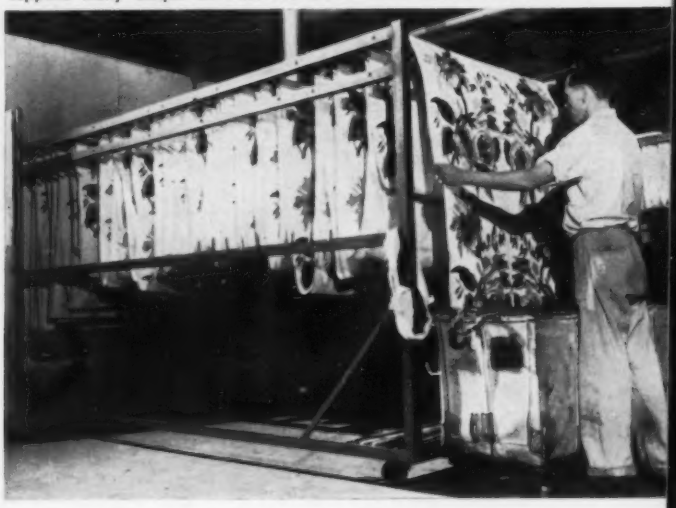
The proper selection of vat dyes is likewise a prime consideration. Generally speaking, the entire available range of vat dyes with very few exceptions may be used. Of major importance is the fact that many vat dyes which perform poorly by the conventional sulfoxylate process are fully satisfactory by the flash aging process. Thus many dyes of superior fastness or shade may be utilized. Careful selection from the offerings of various manufacturers must be made as the performance characteristics of individual formulations may differ widely.

Padding Solutions. The imporance of careful control of the padding solution cannot be overemphasized. Considerable variation between individual formulations for the flash age process exists, but in any case dependable results are obtained only through close at-

Continued on page 116

By modifying hand printing methods, unique colored effects can be obtained. Scalamandré Silks have developed a hand printing process which produces an irregular though pleasing colored effect on fabric or wall paper. The background can be painted by brush, by spray gun, or by allowing color to come through a bottle irregularly.

Pigments and direct fast colors are used more than others, but vats are applied where exceptional fastness is required. Below, operator inspects print during drying operation. The Scalamandré plant is also equipped to dye skeins and fabrics. A modern weaving department supplies many unique constructions an exclusive market calls for.



Hand screen printing

A versatile tool for translating art into fabrics for an exclusive market

by Franco Scalamandré
Scalamandré Silks, Inc.

Exclusive

DURING early centuries, prints were considered reproductions of woven fabrics, and were made for the classes that could not afford the finest. Over a period of years, however, artists of many countries made lasting contributions in design to make prints fashionable even among royalty.

In books written on printed fabrics, most of the credit has been given to English and French production, but we would like to call attention to the tapestry of "Sion," an Italian print of the 14th century, now the property of the Historical Museum of Basle, Switzerland. This is one of the best documents of Italian contribution to printed textiles.

Countries of the Orient have played an especially influential part in the early history of printing. Portugese merchants introduced the French to painted or printed fabrics from India and Levant. This probably took place in 1630 and 1640. The patterns aroused universal admiration for the brilliancy of their colorings, which were also of amazing fastness, and for the fantastic animal and flower motifs, taken from Oriental fairy tales. In France, all the ladies of the court clamored for gowns made of "Toile Peinte," as printed or painted fabrics were called. These fabrics were also known as "Indiennes," "Suratas," or "Patinas," depending on the country of their origin.

During the reign of Louis XVI, printed fabrics reached such a height of popularity that a royal envoy was sent to Siam and other Eastern countries to gather examples of the finest printing. It was in this era that the industry flourished in France, making many contributions to the art of hand screen printing.

At the Scalamandré Museum of Textiles there are many original documents of early Italian, French, and English printed fabrics. These are of great artistic and historic value, but in all cases the colors have a tendency to rub off. Even antique pieces, marked as "Bonteint" (good color), rub off quite easily.

Today, we can offer the public many kinds of printing: Combinations of direct colors and pigments; combinations of hand painting and applications of pigment to obtain antique effects; or modern, straight geometric lines. And the fastness of the pigment colors is excellent for use against direct light. We can also reproduce early works of art, as we constantly do at the Scalamandré plant, by hand screen printing and hand painting techniques, even to the extent of duplicating the antique quality of the fabric.

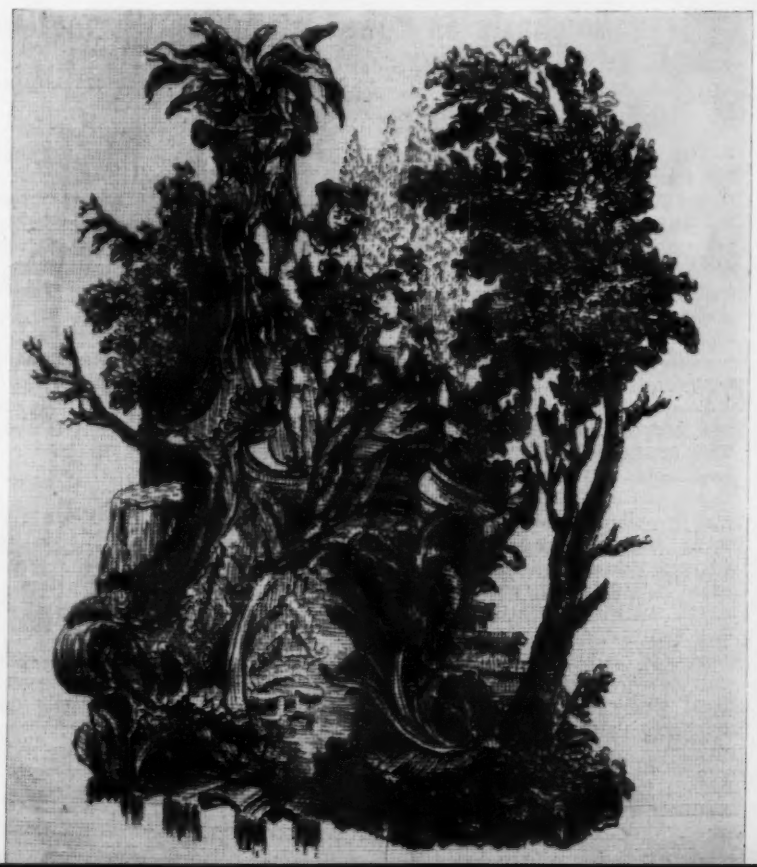
In the last decade, we at Scalamandré have been aware of the automation fever and its enormous progress. Though we have equipped our plant with automatic looms and have installed modern,

Large-size patterns, in more than 20 colors, are typical of Scalamandré production. In printing, better registration is obtained with two people to a squeegee. When a metallic is used, a third man often assists by holding screen in place. Screen printing is not altogether a slow process. At Scalamandré, as many as 3,000 yards can be printed in a day, using all tables for a single pattern.

automatic dyeing machines, we have been happy to keep our hand-screen printing tables, installed over twenty years ago, on which we have developed many printing techniques.

The Screen Printing Process. Very little has actually been written about the art of screen printing and we wish to bring to the reader's attention that the basis of resist printing, batik, or discharge is screen printing. A popular misconception of the preparation of the design for batik or resist printing is that it is done with a stenciled parchment.

Stencil on parchment is similar



This exclusive print in the Scalamandré line exemplifies the ultimate achievement of hand screen printing, in which fabric, design, and color are blended harmoniously. The hand painted effect has been obtained by lack of pressure in applying color by screen —only the raised squares of the petit point fabric are touched by color. The fabric is functional, and its three-dimensional construction lends the print high appeal for upholstery.

to screen printing, but instead of squeegeeing dye through a screen, a powdered dye is forced through little holes in the parchment. In silk screening, the design is painted on silk, or on a net-like broadloom-woven cloth, with a water soluble paint. When the first operation is finished, a lacquer or special paint is used to cover the entire frame. When it is dry, a strong jet of cold water is turned on the screen to remove the part which has been painted with the water soluble paint.

Today, screens are made by two different processes: photographically, or by film. And one screen, of course, is necessary for each color. At Scalamandré we use from 22 to 24 screens to reproduce English hand blocked linens or chintzes, indicating the elaborate nature of our work.

A printed fabric today can become a very commercial product because machine printing can produce as many thousands of yards a day as a man can feed into the machine. But the flatness of the print and the limitation of colors are the reasons for limited sales to a selected clientele. We could have started with machine printing in order to imitate the wooden roll print of the 18th and 19th centuries, but we knew that our clientele could not use the many thousands of yards produced. We decided, instead, to select a method of small production but not exorbitant in cost. That method was hand screen printing.

We have been able to achieve many different effects by using different squeegees. For instance, we can create a striated effect by using a dented squeegee, or we can obtain a better line by using a wooden squeegee instead of a rubber one when we print with pigment colors. We are also able to obtain a better outline and a clearer effect by a new method of table construction, created by us, in which heat travels underneath the table. This makes it easy to control the amount of heat needed for drying the fabric without any discomfort to the workers.

At Scalamandré we use selected direct fast colors and pigments. The directs are just as fast to sunlight as vat colors, but not as fast to washing. If a client wants a high degree of fastness, we of course advise vat colors only. In our method of printing with direct fast colors we are able to print practically any shade desired, and we are able to satisfy the close scrutiny of our decorators, who have a trained eye for perfection of color.

After printing, we wash our direct fast colors in lukewarm water with a fixing agent. During this operation, which also removes excess dye, we can antique the background, if necessary, to match a sample that has been in circulation for five or six years.

In printing with direct fast colors we have the advantage of seeing the colors as soon as they are printed. With vats, it is necessary to wait until all the colors have been printed before they can be developed.

Tried Machine Printing. Back in 1932, in Italy, we worked on the development of a machine printing table and we were very successful. Though we achieved a higher production we had no way

Emphasis on "new" at AATCC convention

30 suppliers to participate in exhibit

■ THE TECHNICAL program for the forthcoming national convention of the American Association of Textile Chemists and Colorists will amplify the convention theme—"New Fibers, New Blends, New Fabrics," according to an announcement by Dr. S. Graeme Turnbull, Jr., of E. I. du Pont de Nemours & Co., Inc., who is chairman of the technical program committee.

Leading spokesmen of the industry will address themselves to the dyeing and finishing of the new fibers and blends, including blends of synthetic and natural fibers, Dr. Turnbull explained. New dyeing equipment and processes will also be covered during the three-day program, he said.

The Awards Luncheon on Thursday will be followed by a presentation of Ciba Eidophor, a closed circuit television program. The technical program will close on Saturday noon with an address entitled "Textile Industry Looks Ahead," Dr. Turnbull stated.

Thirty suppliers to the wet processing segment of the textile industry had planned, as of August 5, to participate in the exhibit to be held in conjunction with the Association's 39th annual convention at the Sheraton Hotel in Philadelphia, Pa., on October 6 - 8, 1960, according to L. Kevin McChesney of the Exhibits Committee. The names of the exhibitors and nature of their displays follows:

WHOM AND WHAT YOU'LL SEE

American Viscose Corp.—new fibers

Arnold, Hoffman & Co., Inc.—mannequins on revolving table

Atlas Electric Devices Co.—Fade-Ometer, Launder-Ometer, Accelerator, scorch tester, perspiration tester, crockmeter, etc.

Becco Chemical Division, Food Machinery & Chemical Corp.—hydrogen peroxide bleaching applications

Carbic-Hoechst Corp.—printed and dyed textiles

The Chemstrand Corp.—dyeing techniques for Acrilan and nylon

Ciba Co., Inc.

"Daily News Record"

Davidson & Hemmendinger—color matching computers and color difference computers

Diamond Crystal Salt Co.—samples of salt products

Fisher Scientific Co.—Bausch & Lomb Spectronic 505 ratio recording spectrophotometer, a selection of Mettler balances and pH equipment

Gaston County Dyeing Machine Co.

Goodyear Tire & Rubber Co.—textile applications for Chemigum, Pliolite, and Pliovic latices

Howes Publishing Co., Inc.

International Salt Co.—products

of inspecting every impression; and the follow-up of the printing screens on the table was such that you could not see every single impression. Thus, a misprint or a small hole in the screen could not be detected until the printing was finished. After 50 or 100 yards had been printed, it was too late to correct the poor printing and the loss could have run from $500 up, in the case of many fabrics that we print at Scalamandré.

It is not unusual for us to make original designs, cut screens, and print fabrics in special colors for orders ranging from 30 to 50 yards. We believe that this kind of small yardage is in no way competitive with faster methods of production. But screen printing can also be made into a very fast production. We know that if a client, such as a hotel, needs a thousand yards of a one-color design, he can use our sample as a model to submit for pricing elsewhere. If he were to come to us and explain his requirements, I am sure we would be able to improve our price. For in such a case we could make two or three screens exactly alike and use all of our tables to print approximately 3,000 yards in a day.

Our decision to use screen printing enabled us to reproduce fabric for the Schuyler Mansion of Albany, N. Y., and for the Deerfield Restoration, because in each case the design called for a repeat of 1-¼ yards, which is impossible to produce on a roller printing machine. The designs were reproduced in pen and ink by Flora and Adriana Scalamandré, who worked directly on the cellophane film from which the screens were made.

After 12 years, the screens are still in use and we print 15- to 75-yard orders on occasion. One of these designs, incidentally, which is titled "The Blind Man's Buff," has received international recognition. It appeared in a recent publication of Britain's Victoria and Albert Museum.

On some occasions, we also create new fabrics, which are woven on our own looms, to obtain unusual but highly artistic printed effects. We have just created a new fabric that imitates the French petit point of the 18th century to a remarkable degree. The lack of pressure in screen printing enabled us to print only the raised squares, where the wool or rayon comes in, to give the effect of a hand painted fabric. We can also imitate hand painted fabrics by using a combination of direct fast colors and pigment colors.

In the beginning, we were advised that it would be impossible to produce fine lines by the hand screen method. We solved this problem by painting directly on the film, which would be used to produce the negative necessary to make the screen. We then had to solve the problems of color spreading on fabric, and the expansion or stretching of fabric. We were able to control these by producing different fabrics for different kinds of printing, and by using different solutions for different effects.

It might be said of hand screen printing, in conclusion, that it offers versatility in the production of art, which satisfies the connoisseur's exacting demands in design and color for exclusive ownership.

and Brinomat evap. salt dissolver

Morningstar-Paisley, Inc.—sizings, finishes, fabrics

Morton Salt Co.—own backdrop describing uses of salt in textile industry

Putnam Chemical Corp.—dyed material and product samples

Richmond Oil, Soap, & Chemical Co.—textile chemical specialties

Refined Products Corp.

Rohm & Haas Co.

Sandoz, Inc.

Schuylkill Chemical Co.—Skulite ammonium sulfate and murexide

Test Fabrics, Inc.

TEXTILE INDUSTRIES

"Textile World"

Arthur H. Thomas Co.—laboratory apparatus

Union Carbide Chemicals Co.—chemicals for the textile industry

Wallerstein Co. — information booth

Celanese Corp. of America

Single-bath method for dyeing wool and Dynel

■ NEW single-bath procedures for dyeing blended fabrics of wool and Dynel modacrylic, which reduce dyeing time by 50 per cent and more, have been announced by the Textile Fibers Department of Union Carbide Chemicals Company, Division of Union Carbide Corporation.

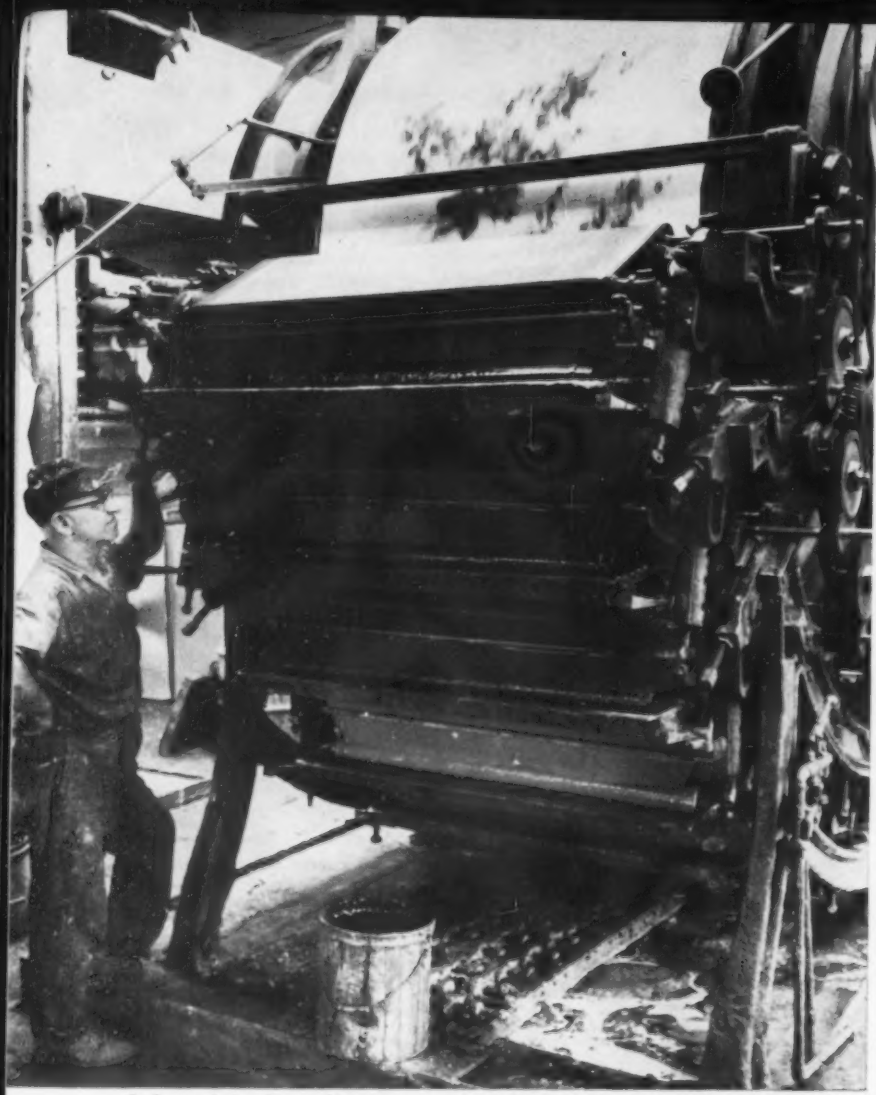
Developed by Carbide's textile service laboratory in cooperation with Geigy Chemical Corporation, the new methods are designed to attain good unions or cross dye effects on wool with Dynel in blend fabrics for children's wear, skirts, sportswear, robes, and others where washability is required. When combined with recommended finishing techniques, the methods give resulting fabrics high wash-fastness, excellent hand and dimensional stability, the company reports.

The procedures are said to eliminate the neutralizing step on carbonized fabrics prior to dyeing, and to solve a primary difficulty in dyeing combinations of hydrophilic with certain hydrophobic fibers in a single bath.

The new method relies on two chemicals for a trouble-free dyeing procedure—Tinegal RWI, manufactured by Geigy, and Peregal TW, distributed by General Dyestuff Corp. Tinegal RWI ensures level dyeings in an acid bath using the weak-acid or neutral dyeing wool dyestuffs. It also permits shade corrections with these dyestuffs near the boil. Peregal TW functions as an anti-precipitant, helping to maintain anionic wool dyes and cationic Dynel dyes in a finely divided state throughout the dyeing cycle.

Using the procedures in extensive mill dyeings for 70% wool - 30% Dynel blends, Carbide technicians report a reduction in dyeing time from more than eight hours for a two-bath method to between two-and-a-half and four hours for the new method.

This means that the new method can make possible more dyeings per shift than with the two-bath method.



Surface printing by machine is a recent introduction to the textile field, although it has been common in the wall paper field for more than a hundred years. During printing, only the raised (pattern) areas of the rollers press against the fabric, transferring a film of color without penetration. Patterns printed by this method have a hand-painted appearance and softer outlines, unlike the machine perfection of the intaglio roller.

Surface printing

Sometimes referred to as mechanized block printing, it gives patterns a hand-painted appearance and faithfully reproduces painted designs

Staff prepared—Exclusive

HAND BLOCK printing is perhaps the earliest method of coloring textiles in artistic designs. Its actual origin is not exactly known, though it is likely that the concept of using carved wood to transfer color to cloth had occurred to many artists and wood craftsmen in ancient times. Over the centuries, the art reached greater heights of perfection, becoming widely practiced in most regions of the world. Even today, hand block printing persists, though not on a large scale because of the time and labor that it requires.

The appeal of block printed fabrics served as the chief impetus to early inventors who sought to mechanize hand printing. It is believed that the earliest production model of a block printing machine originated in Germany in about the middle of the 18th century. It was a crude, though workable apparatus, which allowed printing with a group of wooden blocks rather than with only one. Toward the middle of the 18th century, however, efforts to advance mechanized block printing were obscured by the invention of a machine which printed a continuous pattern from intaglio engraved copper rollers. This original model has not changed in principle to this day. It was so soundly conceived that in a relatively short time it became the principal unit of printing production. But the printed effect produced by intaglio engraving did not in all cases duplicate hand block printing, though it offered greater versatility in design, particularly where finer lines and sharper detail were essential.

In time, hand block printing did become mechanized. The first machine, of German design, made its appearance in about the middle of the 19th century. It has proved to be the only machine of commercial importance. Its method of transferring color to fabric is in principle similar to that used in hand block printing. The color is fed by a roller, rotating in a pan of color, to an endless felt blanket, which deposits the color in a film on the raised surfaces (blocks) of a rotating roll, adjusted to press lightly against the fabric.

In this country, "kiss" printing,

as it is also known, has been used for many years in printing wall paper, where designs of a natural, "hand painted" appearance have a strong appeal among women and interior decorators. Its use in printing textiles, however, is relatively recent, going back only 13 years when W. W. Bolton and Frederick J. Daley founded Dalbolt, Inc., in Keene, N. H., exclusively as a decorative printing firm.

Not long after the company went into production, however, management began to look for new fields to maintain its productive capacity. And in 1950, the plant converted most of its production to the printing of plastic for the drapery and curtain fields. For a time, Dalbolt was the major printer of plastic for draperies, curtains and shower curtains. But it soon found the market to be a shrinking one with an abundance of competition.

Then, after exhaustive research, machinery was adapted and colors formulated which made it possible for surface printers to successfully print all types of textiles with the fastness qualities required by the drapery, curtain, and decorative fields.

Since 1951, Dalbolt has established itself as the largest surface printing plant in the country. Today, its plant operations are well developed, producing annually a printed volume with an estimated retail value of $50,000,000.

Appearance of Simplicity Is Deceptive. A casual observation of Dalbolt's plant is apt to be misleading, for there are only a few processes and these appear to be uncomplicated. Moreover, they occupy little space. However, the machinery and equipment that are required represent a tremendous investment and call for high professional skills in operation.

Of first importance is the engraving process. Unlike intaglio roller engraving, where the pattern is engraved or etched into the copper cylinder, the printing surface remains raised, while the remainder of the roll's surface is expertly cut away to a depth of ¼ inch. As in roller printing, however, the rollers (one for each color) must be engraved to fit precisely.

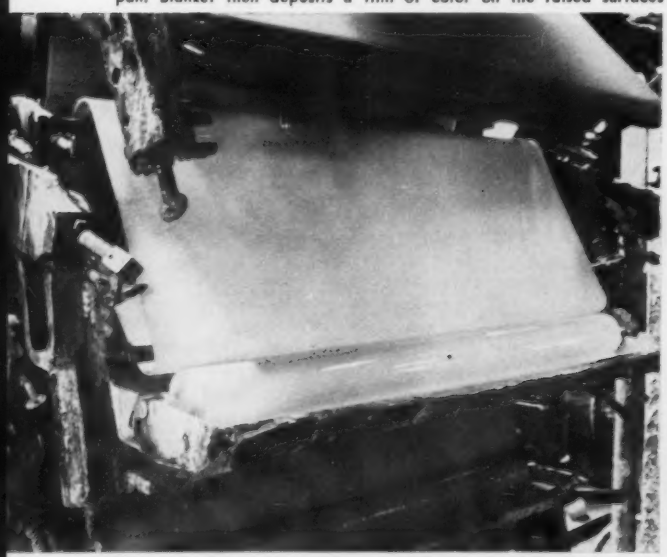
Aside from engraving skills, numerous adjustments are made on the machine. Among these are the exact positioning of rollers and their proper adjustment against fabric for proper transfer of color. Printing skill also calls for a proper amount of color pick-up by the supplying cloth. Though this is adjustable by a rod which presses against the blanket, the skill is in knowing how much color the blanket should retain.

And not of least importance is color preparation and formulation. Dalbolt uses pigmented emulsions exclusively. These have been specially developed at the plant to meet the unusual requirements of flow and viscosity. Colors are selected to meet standards of fastness that quality drapery markets call for.

Of interest is the simplicity of production flow. After printing, the fabric enters a 100-ft-long, loop drying and curing range, of modern design, for fixation of pigment. The fabrics are then inspected and prepared for shipment.

Advantages Over Intaglio Printing. Printing from raised surfaces has certain obvious advantages over intaglio roller printing. For one thing, there can be no contamination of colors since the "routed" surfaces of the roller, which do not carry color, are not in contact with fabric. And color

In operating principle, the machine is simple, but it requires professional skills in engraving, printing, and color formulation to obtain the desired effects on patterns that generally call for 8 to 12 colors. Close-up photograph at left below shows an endless felt blanket to which color is furnished by a roller, rotating in a color pan. Blanket then deposits a film of color on the raised surfaces of roller (obscured by blanket) from where it is transferred to fabric under light pressure. Pattern areas of roller, which transfer film of color to fabric, are untouched during engraving, remain as raised "blocks" (see right photo). The areas of roller which are not part of the pattern are ¼" lower, having been removed or routed by skilled machine engraving.



shading is less complicated because these is no pressure to cause variable or excessive color penetration. Rejection of shipments because of faulty shade matching is practically unheard of at Dalbolt.

To a large extent, the pattern effects obtained by surface printing approximate the screen printed effect. Of course, panels of large size are not possible. However, patterns can be printed in repeats of up to 38 inches, in 6 to 12 colors. From an economic standpoint, the method is more expensive than screen printing for it requires high initial costs of engraving and setting-up time. For large runs, it is obviously more economical.

Because color transfer does not involve pressure, surface printing is particularly suitable for printing fiber glass fabrics, which can be easily crushed. At the present time, glass printing constitutes a substantial share of Dalbolt's production.

Ten years of printing for the textile drapery field is strong evidence that a place exists for surface printing. Though it has definitely encroached on drapery markets, it is not actually competitive with intaglio roller printing, for the two methods produce dissimilar printed effects. Its acceptance can be attributed to the hand painted effect that it lends to designs without the monotonous uniformity and perfection of intaglio roller printing.

Flash aging *(from page 109)*

tention to its preparation.

Alkali and sodium hydrosulfite are used in all cases with the addition of salt or thickener. Caustic soda may be used alone or with soda ash. Some vat dyes require a solution containing 6 to 8% caustic soda for full development but as this concentration causes bleeding with some other dyes, 2% caustic soda in combination with 10% soda ash is usually a satisfactory compromise between color yield and width of color range.

The solution is made up with up to 15% Glauber's salt or thickened slightly with modified locust bean gum to guard against bleeding of the colors in the ager. Best results are obtained from a cold solution, since the hydrosulfite is readily decomposed at higher temperatures. The solution is usually prepared with all the ingredients included except the hydrosulfite, which is added in appropriate amounts to portions of the stock mix as required. In this manner fresh solution is constantly being fed to the padder. Sodium hydrosulfite to the amount of 5% to 6% is usually sufficient.

The flash aging process is firmly established in the screen printing industry, each plant having developed its own arrangement of equipment and the procedure best suited to its individual needs. With the increased production from automatic screen printing machines, many old and inadequate ranges have been scrapped and replaced by more efficient apparatus. Emphasis has been placed on speed of operation and uniformity of results so that the flash aging process is rapidly approaching the status of a routine operation.

UNFOLD THIS CHART for the latest data on automatic screen printing machines

Service life for outdoor fabrics increased by wet finishing operations

■ WET FINISHING processes such as desizing, scouring, and bleaching make outdoor cotton fabrics stronger and less susceptible to mildew according to research workers at the USDA's Southern Utilization Research and Development Division in New Orleans, La.

As part of a research program conducted in cooperation with the Canvas Products Association International, they investigated the effects of these operations and found that these treatments, although inexpensive, tended to purify cotton cellulose and reduce the foreign substances which encourage the growth of microorganisms. They are not proposed as substitutes for chemical treatments, however, but only suggested as supplemental finishes to help combat exposure problems.

Some of the results of comparative tests conducted on grey and scoured fabrics show that mildew became apparent on the grey fabric within three months after outdoor exposure was begun, whereas the scoured fabric showed little or no indication of mildew in the same period. After 12 months exposure, the scoured fabric had 56 lb strength compared with 20 lb for the grey duck.

Similar interesting results were obtained on cotton oxford fabric, one part of which was kept in the grey, another part desized, and the remainder desized, scoured, and bleached. Results after exposure clearly showed the value of removing noncellulosic constituents from cotton fabric intended for use outdors. At the end of six months, the grey fabric had 26 lb of breaking strength; the desized, 33 lb; and the desized, scoured, and bleached, 39 lb; although before exposure the grey fabric was slightly stronger than the others.

These and other practical demonstrations of the value of scouring and bleaching for vinyl coated fabrics are described in "Desizing, Scouring and Bleaching Improves Cotton for Outdoor Use," single copies of which may be obtained free of cost from the Southern Regional Research Laboratory, P. O. Box 19687, New Orleans 19, La.

Textile Industries

for September 1960 presents..... **MA**

Thorne

PHOTOS FROM A SOUTHERN MILL, COURTESY THORNE-BROWN CO., INC.

Name of Machine:
Thorne

Manufacturer:
Thorne-Brown Co., Inc., Westport, Conn.

Principle of Operation:
Fabric is fed onto an endless rubber conveyor and held in place by a water-soluble adhesive. Conveyor advances fabric to correct position (under screens) for printing. The printing cycle then consists of (1) lowering of screens, (2) printing—consists of single stroke of squeegee, (3) raising of screens, and (4) advancing fabric for resumption of cycle.

Conveyor is washed continuously for re-application of adhesive to a clean surface.

Principle of Color Application:
"Wet on wet"

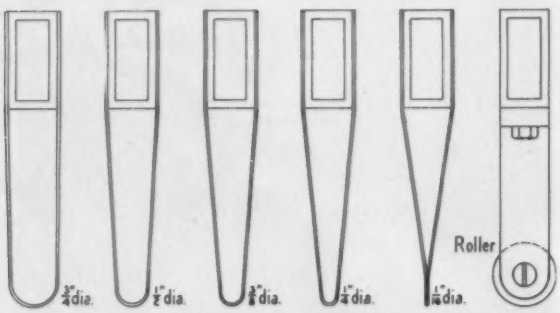
Accuracy of Register:
1/64"

Method of Color Feeding:
Manual

Squeegee System and Operation:
Only one squeegee is required, making only one passage across screen in warp direction of fabric. Upon conclusion of each stroke, while fabric is advancing for resumption of cycle, the squeegee is moved to other side of color paste for a stroke in opposite direction.

Squeegees in all print stations move in unison, being controlled by a single power source.

Squeegee Profiles:
Selection of squeegee is made from six basic profiles. Squeegees are made of a 20-gauge polished stainless steel. They are not flexible. They include a roller type, which is used for extremely heavy applications of color paste (see drawings).



Pressure of the squeegee on the screen is light. Printing follows the principle of a hard squeegee working on a relatively hard surface; the printing surface is extremely flat and level, backed up by a thin layer of hard felt under the conveyor.

Machine Specifications and Comments:
Machine can be assembled in any number of standard 8-ft sections, thus making a length suitable to any requirements. Printing widths are limited by blanket width of 96 inches. Repeats begin at 16 inches and are infinitely adjustable to any desired length. Largest machine on market accommodates 16 colors with a pattern repeat of 54 inches.

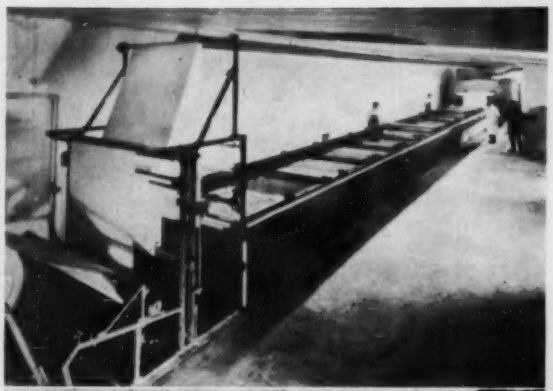
Squeegee carriage track and screen frames are fixed to the main lifting beams which also run the length of the machine on both sides, raising and lowering all the print stations in unison. Conventional hand screen frames of either wood or metal can be used.

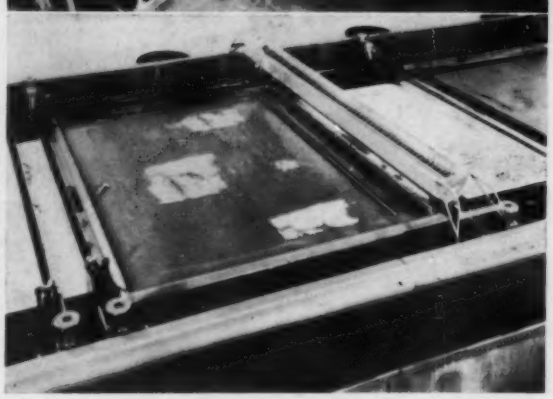
Conveyor advances by means of a self-contained variable speed hydraulic transmission, and is stopped and held in place by a magnetic brake during printing. Large use is made of standard American parts for rapid interchangeability.

Number of Installations in U. S.:
3

MACHINERY FOR AUT

Zimmer





PHOTOS COURTESY ZIMMER'S ERBEN KG

Name of Machine:
Zimmer Screen Printing Automat

Manufacturer:
Zimmer's Erben KG, Waidmannsdorfer Str. 115, Klagenfurt, Austria

U. S. Representative:
Sherwin Sales Co., Inc., 249 E. 48th St., New York 17, N. Y.

Principle of Operation:
Fabric is fed onto an endless rubber conveyor and is held in place by a water-soluble adhesive. The conveyor advances by means of a hydro-pneumatic device to correct position (under screens) for printing. The printing cycle then consists of (1) lowering of screens, (2) printing—movement of roller-type squeegee across screen, (3) raising of screens, and (4) advancing fabric for resumption of cycle.

Conveyor is washed continuously for re-application of adhesive to a clean surface.

Principle of Color Application:
Can be "wet on wet" or "wet on dry."

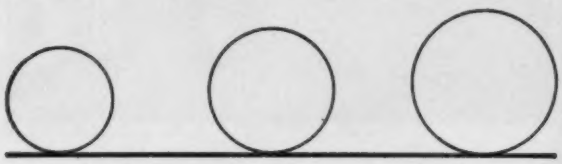
Accuracy of Register:
0.004"

Method of Color Feeding:
Gravity feed from vessels with variable flow.

Squeegee System and Operation:
Round metallic rods are used as squeegees. They are machined from an alloy having magnetic and corrosion resistant properties. For operation, they are simply placed on the screens (one to each screen), having no mechanical attachment to the screens. Both the stroking motion of the squeegee and its pressure against the screen are controlled by an arrangement of electromagnets located under the printing blanket, which are moved hydraulically. A six-step control regulates the attractive force of the electromagnets on the roller squeegees.

Squeegees move simultaneously in warp direction of fabric. Normally one stroke is sufficient, but cycle can be adjusted for two strokes.

Squeegee Profiles:
Typical roller squeegee is ¼" in diameter, but larger diameters are available to suit specific printing conditions. The larger diameter rollers are used for heavier materials (see drawings).



Machine Specifications and Comments:
Conveyor advances by means of a hydro-pneumatic device, which consists of suction units spaced to grip the blanket across its entire width. The suction units are connected to rods which are hydraulically driven and held firmly in place during printing.

Screens can be lifted at both sides simultaneously, or at left side of screen first and right side last.

Hydraulic mechanisms lower and lift screens, move squeegees, and advance conveyor.

Machine is available in three standard models, allowing numerous printing widths up to 79 inches. Two standard drives are available for any of the three models, allowing a repeat of 15 to 80 inches, and 15 to 50 inches respectively. Number of colors is unlimited but the practical range is from 6 to 12. Machine can be custom built to individual requirements.

Number of Installations in U. S.:
1

FREE REPRINTS of this chart are available, on the basis of one per reader, as long as the supply

OMATIC SCREEN PRIN

Ichinose

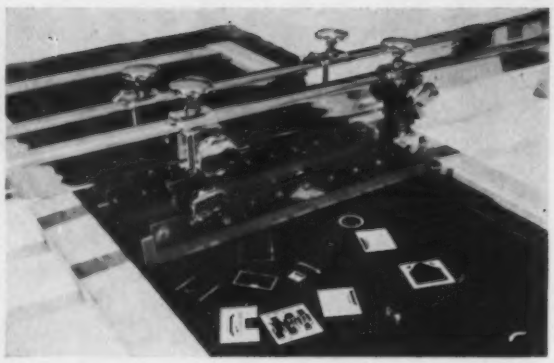


PHOTO COURTESY TOSHIN KOGYO CO., LTD.

Name of Machine:
Ichinose

Manufacturer:
Toshin Kogyo Co., Ltd., C. P. O. Box 367, Osaka, Japan

U. S. Representative:
Edward S. Rudnick, P. O. Box 244, New Bedford, Mass.

Principle of Operation:
Fabric is fed onto endless conveyor, made of a special rubber composition, and held in place by a water-soluble adhesive. Conveyor advances fabric to correct position (under screens) for printing, being driven by an endless steel belt, set on a driving roller at one end and driven roller at other end. Printing cycle then consists of (1) lowering of screens, (2) printing—movement of squeegees across screen, (3) raising of screens, and (4) advancing fabric for resumption of cycle.

Conveyor is washed continuously for re-application of adhesive to clean surface.

Principle of Color Application:
"Wet on wet." Infrared intermittent drying can be used if required.

Accuracy of Register:
Within 0.3 mm (about 0.01")

Method of Color Feeding:
Manual

Squeegee System and Operation:
Two squeegees move alternately across screen in filling direction of fabric. In first stroke, one squeegee remains idle (in raised position) while other is pressed against screen, pushing color paste forward, allowing it to pass through screen. On return stroke, idle squeegee is lowered and other is raised. Pressure on squeegees is adjustable. Multiple strokes of squeegees are possible.

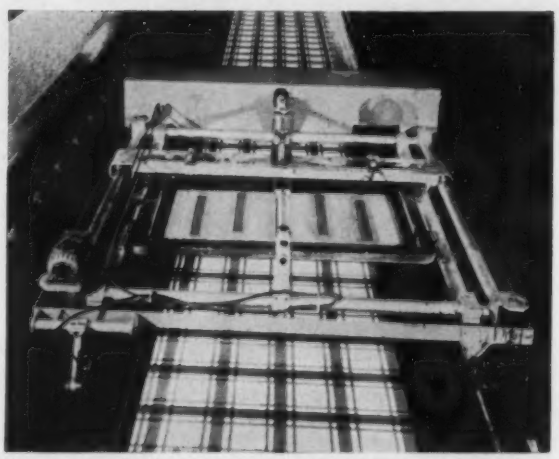
Squeegee Profiles:
Squeegees are of rubber composition, available in various profiles, and various degrees of hardness to suit printing requirements.

Machine Specifications and Comments:
Conveyor is mechanically driven, but is locked into precise length of repeat by hydraulic-mechanical means.

Machines are built to accommodate a maximum width of 60 inches and a maximum repeat length of 72 inches, in up to 22 colors. But machines can be custom built to suit individual needs.

Number of Installations in U. S.:
One presently being installed.

SACM



This photograph illustrates another approach to mechanizing hand screen printing—the Chariot-Automoteur automatic screen printing carriage of Société Alsacienne de Constructions Mécaniques, Mulhouse, France. The carriage is designed for application to existing hand screen printing tables. The screen is placed in carriage, color paste is added, and carriage is moved by electric power, applying color to fabric at each station with appropriate squeegee action. After reaching end of table, carriage returns to starting position. U. S. representative is SACM, 3 Channing Place, Cambridge, Mass.

Continued on other side

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NTING OF TEXTILES

World Survey of Automatic Screen Printing Machines

North America	Stork	Buser	Zimmer	Reggiani	Comerio Ercole	Meccano-tessile[1]	Thorne	Ichinose	Total
Canada	2			1					3
Cuba	1								1
Mexico	1	1	1						3
United States	4	16	1	5	1		3		30
Central and South America									
Argentina	1				2				3
Brazil					3				3
Chile		1							1
Colombia	1								1
Guatemala			1						1
Peru	1		1	1	3				6
Uruguay		1			1				2
Venezuela						1			1
Europe									
Austria	2		3	1					6
Belgium	1	3		2		1			7
Czechoslovakia		2							2
Denmark	2	1							3
Eire	2	2							4
Finland		1							1
France	10	2	6	20	3	2			43
Germany	22[2]	16	12	13					63
Greece	2	1							3
Holland	4	5		1	2				12
Hungary	1	1							2
Italy	2	1	1	30	17	22			73
Norway			1						1
Poland	1	1							2
Rumania					3				3
Spain	1	3	1	1	2				8
Sweden	1	1	1						3
Switzerland	1	8							9
Turkey					1				1
USSR	1								1
United Kingdom	12	10		5	2				29
Yugoslavia			1						1
Africa									
Congo	2								2
Egypt	5				3				8
Ethiopia						1			1
French West Africa	1								1
Malagasy Republic (Madagascar)	1								1
Morocco		1		1					2
Asia and Oceania									
Australia	4	2							6
Burma	1								1
China	1	5		1					7
India		1			7				8
Iran			2						2
Israel	2								2
Japan	1	3			1			>65[3]	>70[3]
Philippines	2	1							3
South Korea	4				2				6
Syria	2								2
Totals	101	90	32	82	53	27	3	70[3]	458

[1]The Meccanotessile machine, made by Meccanotessile di Fontana & Lanfranconi, Via Pannilani 1, Como, Italy, was not included in the descriptions of automatic screen printing machines, since insufficient information was available as we went to press. Similarly, no information was available on the machine manufactured by Camillo Reisinger Apparatebau of Vienna, Austria (see TEXTILE INDUSTRIES for November, 1959, p 94).

[2]Federal Republic, 20; East Germany, 2.

[3]Of the 70 Ichinose machines installed, more than 65 reportedly are in Japan.

Source: Figures for the Stork, Buser, Reggiani, Thorne, and Ichinose machines were obtained directly from the manufacturers or their U. S. representatives. Data for the Zimmer, Comerio Ercole, and Meccanotessile are from a survey made in early 1960 by a source which the editors of TEXTILE INDUSTRIES consider reliable.

Buser

STAFF PHOTO MADE AT STONEMENSE PROCESSING CORP., CEDAR GROVE, N. J.

Name of Machine:
Buser Hydromag II

Manufacturer:
Fritz Buser AG, Wiler, Switzerland

U. S. Representative:
Jungfrau, Inc., 145 E. 57th St., New York 22, N. Y.

Principle of Operation:
Fabric is fed onto an endless rubber conveyor, and held in place by a water-soluble adhesive. By means of a hydraulic-magnetic repeat mechanism, the conveyor advances fabric to correct position (under screens) for printing. The printing cycle then consists of (1) lowering of screens, (2) printing—movement of squeegees across screen, (3) raising of screens, and (4) advancing fabric for resumption of cycle.

The cycle is shortened by lowering screens part of the distance while fabric is advancing. When fabric has moved into printing position the screens are lowered remainder of distance to rest on fabric. Conveyor is washed continuously for re-application of adhesive to a clean surface.

Principle of Color Application:
"Wet on wet;" drying units can be installed, if necessary, for drying during printing.

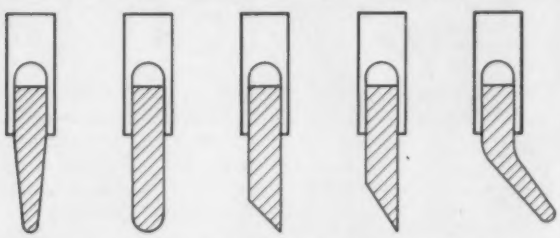
Accuracy of Register:
1/128"

Method of Color Feeding:
Manual

Squeegee System and Operation:
Two squeegees move alternately across screen in filling direction of fabric. In first stroke (one movement across screen), one squeegee remains idle (in raised position) while other is pressed against screen, pushing color paste forward and allowing it to pass through screen. On return stroke, idle squeegee is lowered and other is raised. Pressure on squeegee is adjustable by hand.

Squeegee action is individually controlled in each screen, making it possible to vary number of strokes and speed of strokes among the screens.

Squeegee Profiles:
Five basic squeegee profiles are most commonly used; they vary in profile (shape) and in hardness of rubber. They are selected to achieve desired color effect. Generally, two identically shaped squeegees are used in a combination.



Printing can follow the principle of (1) hard squeegee working on hard surface, (2) soft squeegee working on hard surface, or (3) hard squeegee working on soft surface. Printing surface hardness or softness can be specified to meet individual requirements of plant.

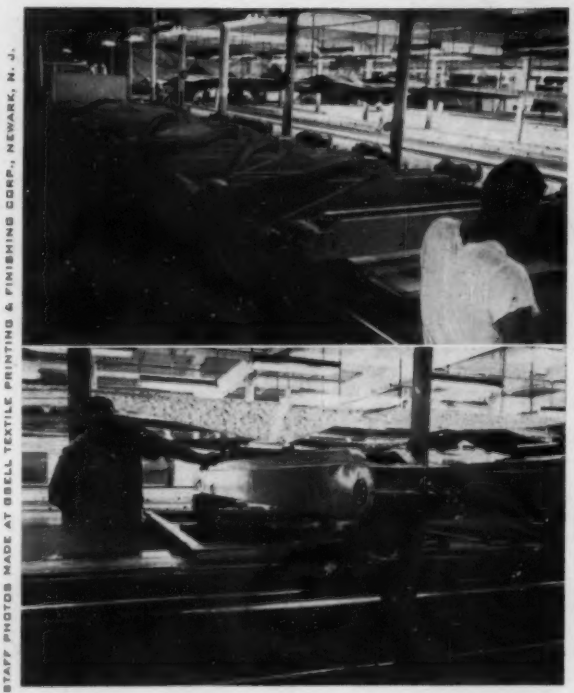
Machine Specifications and Comments:
The Buser Hydromag II is at present built in widths up to 90 inches. Repeat sizes range from 20 to 118 inches, in up to 12 colors. Machines can be custom-built to suit individual needs.

There is only one hydraulic power source required for movement of conveyor and for raising and lowering of screens. Solid magnetic clamps advance conveyor during printing cycle, and a mechanical clamp holds it in place for printing.

Number of Installations in U. S.:
16

MACHINERY FOR AUT

Comerio Ercole



STAFF PHOTOS MADE AT GBELL TEXTILE PRINTING & FINISHING CORP., NEWARK, N. J.

Name of Machine:
Comerio Ercole

Manufacturer:
Comerio Ercole SpA, Via Silvio Pellico 3, Busto Arsizio, Italy

U. S. Representative:
Elmo International, 7 Church St., Paterson, N. J.

Principle of Operation:
Fabric is fed onto an endless conveyor and is held in place by a water-soluble adhesive. The conveyor is of a copper mesh construction, coated with a polyester resin. It is electrically driven. The printing cycle, after fabric is advanced, consists of (1) lowering of screens, (2) printing—movement of squeegees across screen, (3) raising of screens, and (4) advancing fabric for resumption of cycle.

Conveyor is washed continuously for re-application of adhesive to a clean surface.

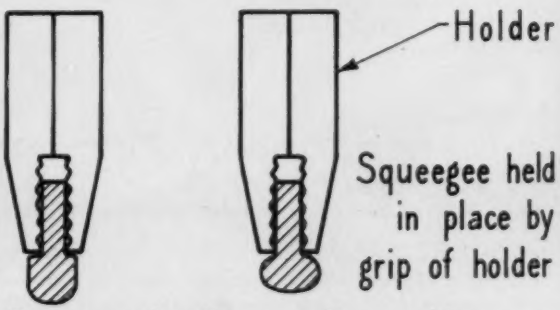
Principle of Color Application:
"Wet on wet" or "wet on dry." Machine is equipped with hot air blowers.

Accuracy of Register:
1/64"

Squeegee System and Operation:
Two squeegees operate alternately in filling direction of fabric. In first stroke, one squeegee remains idle (in raised position) while other moves across screen, pushing color paste forward, allowing it to pass through screen. On return stroke, idle squeegee is lowered and other is raised. Pressure on squeegees is adjustable.

Squeegee action is individually controlled in each screen, making possible variations in number of strokes, from one to four, among the screens. Screens are raised and lowered at one side.

Squeegee Profiles:
An outsize rubber squeegee is available for re-forming into any desired profile by sanding—see drawings of squeegees before and after sanding into shape. Squeegee is of rubber composition. Normally, a moderately soft squeegee is used to follow the principle of a soft squeegee working on a relatively soft surface.



Before and after sanding rubber squeegee to desired shape

Method of Color Feeding:
Manual

Machine Specifications and Comments:
Machine can print up to 10 colors but can be custom-built to meet individual requirements. Repeat size of up to 118 inches is possible on the standard machine, with a printing width of 54 inches.

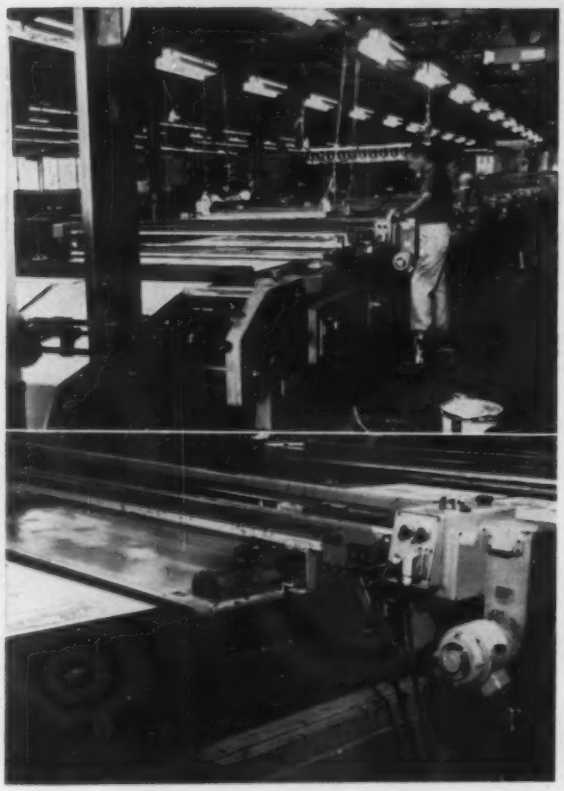
Latest model is reported to be semi-hydraulically operated. Early model is electrically driven. Conveyor is held in place by metal guides, located along either edge, which slide into a groove of roller bearings as conveyor advances. Conveyor advances the distance of a repeat in two movements, the final one for a considerably shorter distance and at a very slow rate of speed for accurate stopping.

Number of Installations in U. S.:
1

FREE REPRINTS *of this chart are available, on the basis of one per reader, as long as the supply*

OMATIC SCREEN PRIN

Reggiani



STAFF PHOTOS MADE IN A SOUTHERN MILL

Name of Machine:
Reggiani Meccanofilm

Manufacturer:
Reggiani Meccanotex SA, Bergamo, Italy

U. S. Representative:
Lendt & Co., Inc., 535 Fifth Ave., New York 17, N. Y.

Principle of Operation:
Fabric is fed onto an endless rubber conveyor and is held in place by a water-soluble adhesive. The conveyor advances fabric by means of a hydraulic piston to correct position (under screens) for printing. The printing cycle then consists of (1) lowering of screens, (2) printing—movement of squeegees across screen, (3) raising of screens, and (4) advancing fabric for resumption of cycle.

Conveyor is washed continuously for re-application of adhesive to a clean surface.

Principle of Color Application:
"Wet on wet" or "wet on dry." Hot air units can be installed if patterns require intermediate drying to obtain sharper effects.

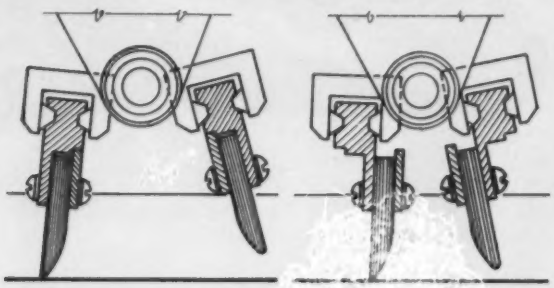
Accuracy of Register:
0.1 mm (about 0.004")

Method of Color Feeding:
Manual, generally. Provisions can be made for supplying color by gravity or automatically.

Squeegee System and Operation:
Two squeegees move together in filling direction of fabric, pressing alternately against screen. The squeegee system (see drawing) allows adjustment of pressure on squeegees and angle at which they move in relation to screen. In first stroke, one squeegee remains idle (in raised position) while other is moving across screen, pushing color paste forward, allowing it to pass through screen. On return stroke, idle squeegee is lowered for movement and other is raised. Space between squeegees serves as a reservoir for color paste.

Number of squeegee strokes can be adjusted in each screen to operate independently of all others. Generally, not more than two strokes are necessary.

Squeegee Profiles:
Squeegees are of rubber and are available in numerous shapes. Selection of squeegees depends largely on



preference of individual printer to achieve desired printed effect.

Printing follows the principle of hard squeegee working on soft surface.

Machine Specifications and Comments:
Standard machine can print up to 12 colors, but machines can be built to a higher number to meet individual requirements. Machine can accommodate fabric widths up to 68 inches and repeats from 15 inches to 65 inches. Repeats of larger size, up to 130 inches, are also possible.

Screens are pneumatically raised (only one-half inch) and lowered from one side only. Conveyor is advanced by pneumatic clamps during printing cycle.

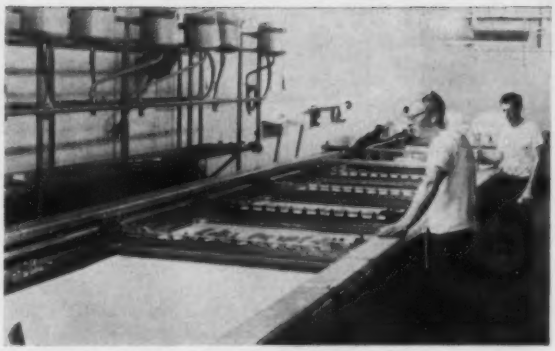
Number of Installations in U. S.:
5

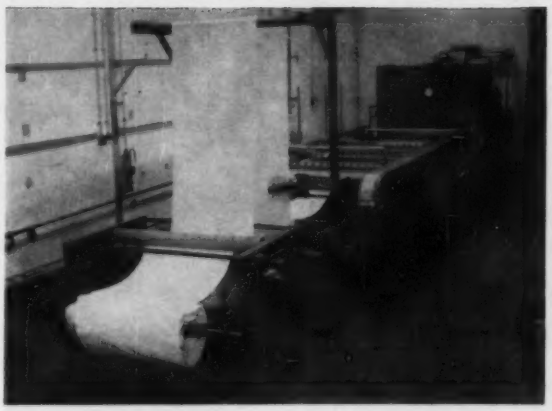
PHOTOS COURTESY COSA CORP.

...s. Write to the Editors, "Textile Industries," 806 Peachtree Street, N. E., Atlanta 8, Georgia

INTING OF TEXTILES

Stork





PHOTOS COURTESY COSA CORP.

Name of Machine:
Stork

Manufacturer:
Gebr. Stork & Co.'s Apparatenfabriek NV, P. O. Box 3007, Amsterdam, Holland

U. S. Representative:
Cosa Corp., 405 Lexington Ave., New York 17, N. Y.

Principle of Operation:
Fabric is fed onto an endless conveyor, of special synthetic rubber composition, and is held in place by a water-soluble adhesive. One electric motor drives two eccentrics and one cam through heavy duty mechanical gears to control the entire printing cycle, which consists of (1) lowering of screens, (2) printing—movement of squeegee across screen, (3) raising of screens, and (4) advancing fabric for resumption of cycle.

Conveyor is washed continuously for re-application of adhesive to a clean surface.

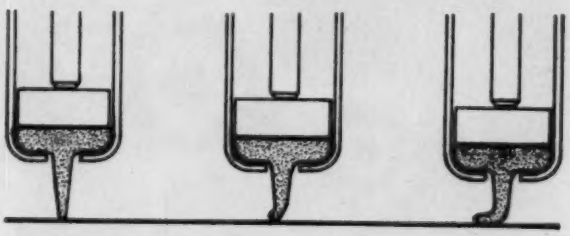
Principle of Color Application:
"Wet on wet"

Accuracy of Register:
Within 0.01 mm (about 0.004")

Method of Color Feeding:
By gravity. The flow is regulated by valve.

Squeegee System and Operation:
Only one passage of squeegee, in warp direction of fabric, is necessary. (For heavy fabrics, a twin squeegee system may be used.) Upon conclusion of squeegee stroke, there is a dwelling motion which places squeegee to other side of color paste for movement in opposite direction.

Squeegee Profiles:
One squeegee of standard design is used. However, it is of elastic rubber composition (50-80 Shore hardness) which can be bent into various profiles by turn



of a screw (see drawings). Printing follows the principle of soft squeegee working on a hard printing surface.

Machine Specifications and Comments:
Machine can accommodate print widths of 51 inches and 65 inches in 5 to 16 colors, with a present maximum repeat of 40 inches.

During advance of conveyor a distance of one repeat, four distinct actions take place: (1) Conveyor moves forward, carrying a measuring block that is clamped to blanket edge by electro-magnetic means. (2) When repeat is almost completed, a hydraulic lever takes over the mechanical drive. (3) Lever then completes the movement, and as measuring block makes contact with pilot switch, the conveyor is stopped immediately. (4) Measuring block is demagnetized to return to previous position for resumption of cycle.

Number of Installations in U. S.:
4

Continued on other side

Proceedings of the 1960

Cotton Research Clinic

Exclusive

The speakers at the third session of the Cotton Research Clinic were: (l to r): **Carl Brandt** of Whitin Machine Works; **Paul West** of Saco-Lowell Research Center; and **Burrell Cole** of Cole Engineering Co.

■ FOUR ADDITIONAL PAPERS presented at the recent eleventh annual Cotton Research Clinic are published in full in this issue of TEXTILE INDUSTRIES.

Pages 99-117 of the July, 1960, issue contained the full text of the following papers: (1) Effect of fiber length on single fiber tensile and resilience properties; (2) Span length as a fiber length criterion: (3) Appraisal of the Digital Fibrograph and Fibrosampler from the mill viewpoint; (4) The Phantom drafting system.

In the August issue were the following: (1) Mill control of short fiber percentage; (2) Effect of short fibers on spinning performance; (3) A new cotton trashmeter; and (4) The Saco-Lowell/Uster Versa-Matic ADC drawing frame.

Concluding the series will be "Influence of fabric structure on tear strength of resin-treated cotton fabrics," a 19-page report of research conducted by Fabric Research Laboratories under contract with the U. S. Department of Agriculture. This article will appear in the October, 1960, issue.

The entire proceedings will be reprinted in booklet form, with reprints available free upon request to the National Cotton Council, sponsor of the Clinic, or TEXTILE INDUSTRIES.—The Editors.

New developments in roving package winding

by Gaston G. Fornes[1] and John H. Robinson[2]
Institute of Textile Technology

ONE OF THE long-sought production goals in a textile mill has been to produce economically high-density, effectively wound packages of roving of high quality. During the past four years extensive work on improving roving package winding mechanisms has been under way at the Institute of Textile Technology. These researches have been along the following general lines:

1. High-winding tension effects.
2. Increased package volume for the same size bobbins.
3. Density variation in the wound package.
4. Winding tension control.

This work has led to the development of the Roving Frame Variable Pitch Builder and the Winding Tension Regulator, which are described here for the first time.

High Winding Tension Effects. By using fewer teeth in the tension and in the lay gears, both the number of roving layers per wound package and the number of coils per layer can be increased; however, the winding diameter has to be carefully and continually controlled or the roving may be stretched, even to the breaking point. Introducing an extra wrap on the presser foot (or normal wraps + one) is the simplest procedure for increasing the roving

[1]Research Associate, ITT, and Professor of Mechanical Engineering, University of Virginia.
[2]Head, Engineering Section, ITT.

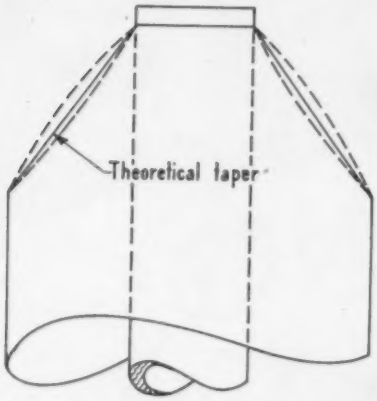


Figure 1. Theoretical taper on bobbin from FS-2 roving frame with 17-tooth taper gear compared with actual taper. The difference indicates bobbin deformation.

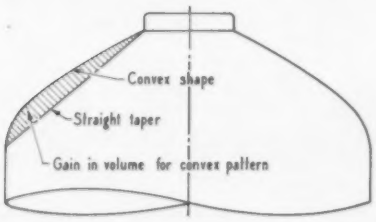


Figure 2. Volume gain for convex profile.

Figure 3. Variable-pitch builder screw.

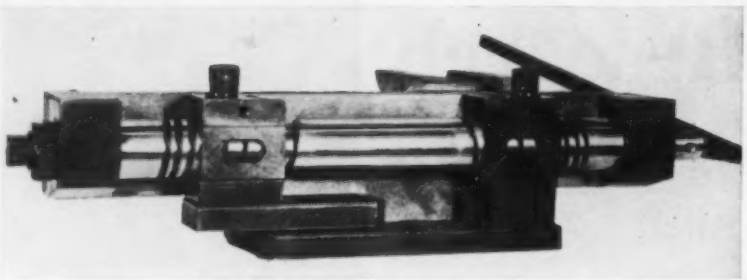


Figure 4. Commercial variable-pitch builder.

winding tension and increasing the weight of the roving package. When this procedure is used, it then becomes a precarious problem to balance the twist, taper, tension, and lay gears to produce a heavier package, because the high-tension wind may produce excessive tension and over-run breaks on the package ends.

Early in 1957, it was recognized at the Institute that increasing the roving winding tension (more layers) by putting on normal wraps + one on the presser foot would result in a substantial increase in the package weight. If a roving frame is in good mechanical condition, increases from 10 to 40 per cent may be realized. It is now standard practice in many mills to use high-winding tension whenever possible based on these early experiments, since the word gets around!

The time-honored method of controlling the package weight has been to increase the roving tension and to decrease the package taper to avoid over-runs until a stalemate was reached in the increment of weight increase. To be able to increase both the tension and the taper was considered impossible with even the best of the latest conventional roving frames.

Early studies and tests at the Institute showed that a roving package has to be wound quite carefully, and that the *effective* winding tension may be several times higher than that needed to break a single free strand of roving. Furthermore, the roving package contains a "memory" of the winding procedure as each coil is wound, and as each inside layer is produced from the bobbin to the outside layer. As the winding tension is significantly increased, more tension breaks occur and more over-runs are likely to occur on the conventional "straight-taper profile" package ends. The effect of the high tension on the final shape of the package is shown in *Figure 1.* Reducing the taper may stop the over-runs but the loss in package volume largely offsets the high tension weight (more layers) gain.

Development of the Variable-Pitch Builder Screw. A revolutionary concept of changing the profile shape for the wound package ends, which permits a convex profile, was conceived at the Institute. This profile curve has a *large* initial taper angle and a controlled decreasing taper angle as layers of roving are added. Mathematically exact curves govern the convex profiles selected for use. This type of profile permits a high volume package and at the same time permits a high-tension wind without increasing over-runs *(Figure 2).*

A successful mechanical device to produce this convex package end profile was developed at the Institute and is now on the market as a roving frame attachment. It consists essentially of a variable-pitch, single-groove, helical builder screw actuating follower-pins in the builder jaws which then control the shortening of the successive layers as they are wound on the package. A photograph of the early models of the variable-pitch builder screw is shown in *Figure 3.* The commercial variable-pitch builder mechanism which bolts into the same position as that occupied by the constant-lead builder screws on most conventional roving frames is shown in *Figure 4.* In no way does the variable-pitch builder interfere with the normal operation of the roving frame and requires no special attention from the roving frame tender.

Increase in Package Volume. By using the variable-pitch builder mechanism on 1.25-hank roving, a comparison test was made on a 10 x 5 roving frame using normal

TABLE 1. Roving-Package Weight Gain Due to Convex Profile

10 x 5 Roving Frame*	Standard Builder Screw	Variable-Pitch Builder Screw
Hank roving	1.30	1.30
Twist gear, teeth	33	33
Lay gear, teeth	36	36
Tension gear, teeth	32	32
Taper gear, teeth	21	21
Roving net weight, oz	40.9	44.5
Weight gain, %	—	8.8

*Both bobbins of roving from same sliver.

TABLE 2. Mill Roving Weight Gains on 12 x 6 Roving Frame Using the Roving Winding Tension Regulator With and Without the Variable-Pitch Builder

	Standard	Winding Tension Regulator	Winding Tension Regulator Plus Variable-Pitch Builder
Hank roving, nominal	0.80	0.80	0.80
Tension gear, teeth	54	51	51
Lay gear, teeth	37	37	37
Taper gear, teeth	18	18	16
Cam offset, in.	0.0	0.70	0.70
Weight, oz	52.0	59.5	62
Weight increase, %	—	14.4	19.2

wraps + one on the presser with the conventional constant lead builder screw versus the variable-pitch builder screw. Keeping all gearing constant, the convex profile builder showed a weight gain of 8.8 per cent due to the increase in the roving package volume *(Table 1)*.

This larger roving package will stand even rougher handling when doffing and creeling than the conventional roving package. The variable-pitch builders operating on larger size roving machines have shown similar gains in volume and increased package weight.

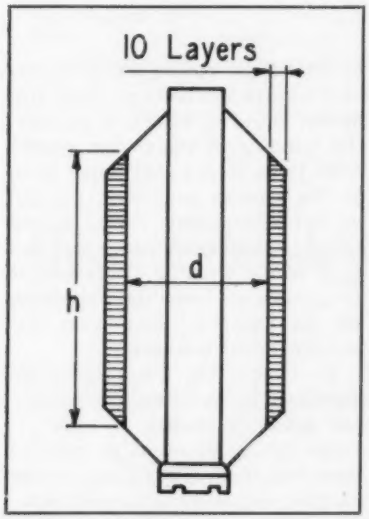


Figure 5. Density variation measurements.

Density Variation in the Wound Package. For a long time, those skilled in the art have known that there are "soft" and "hard" wound layer zones in the roving package. It was also known that the density was greater near the bobbin and was less for the outside layers of the wound package. Since each layer as wound is affected by the subsequently wound layers it is a most difficult task to effectively determine the density variation in finished packages of roving.

How the density variation was determined as the package was unwound in the laboratory is shown in *Figure 5*. By carefully measuring the roving-package diameters and lengths as successive ten-layer increments were unwound and weighed, the increment layer volumes and, hence, densities were

Figure 6. Density variation on standard 12 x 6 package.

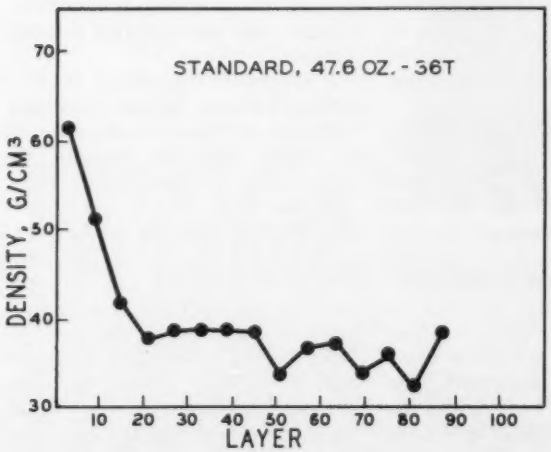
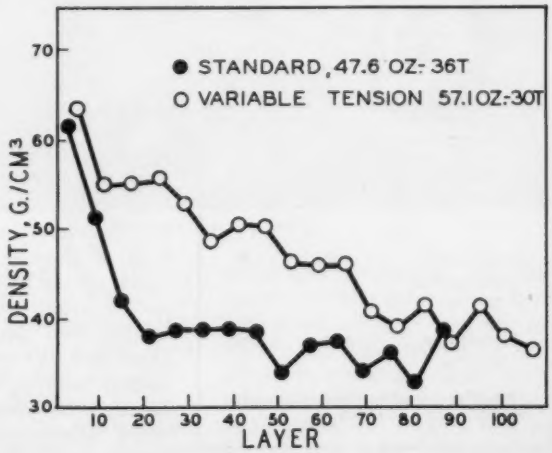


Figure 7. Density variation comparison of 12 x 6 packages.



calculated with the aid of an electronic computer. Sufficient packages were measured in this manner to prove that there is no significant difference in the variation of density of corresponding increments either during or after winding.

For the first time, an accurate determination of the density throughout a wound roving package was made *(Figure 6)*. It will be observed that the density is considerably higher next to the bobbin and decreases as the package layers increase. If packages were wound throughout at this high inner density, the net weight of roving on packages would be increased 100 to 150 per cent. Unfortunately, as the package builds, the wrap-around tension of the roving on the bobbin sharply decreases with the exponential value of the angle of wrap; and, also, the centrifugal tension force increases as the bobbin is wound. These limiting effects determine, in general, the conditions for winding the final layers on the roving package and dictate the winding tension that can be tolerated using the conventional roving frame.

Development of the Winding Tension Control Mechanism. The conventional roving frame attempts to control the winding speed by varying the speed of the bobbins by means of a cone-belt drive. These cones are, at best, a poor variable-speed control device and roving frame manufacturers readily admit that the cones are designed to fit average conditions for such variables as hank roving, humidity, temperature, tension, twist, lay, staple length, etc., and that for specific operating conditions extensive compromises may be necessary. Once such average conditions are selected by the machinery manufacturer, the size and shape of the cones are fixed and it cannot be accurately predicted what the bobbin *winding speed* will be for any given cone-belt position.

A skilled roving tender often has to rescue a doff of roving by stopping the frame and "jacking ahead" the cone-belt to relieve the excessive winding tension. This problem is as old as the cone belt-drive, since there is no way to vary the bobbin winding speed on a conventional roving frame while it is running.

How to produce a roving package of uniformly high density? How to produce a package wound with more uniform tension? How to prevent excessive tension breaks? How to modify a conventional roving frame to obtain heavier packages without sacrifice in quality and performance? Questions such as these are never completely and fully answered. The Institute has made long strides toward answering these questions by devising a roving winding tension control mechanism. What this device does, in effect, is to start the winding of the roving bobbin with 10 to 25 per cent *fewer* teeth in the tension gear than are put on the conventional roving frame, for the sliver being processed, and then as the winding of the bobbin progresses to move the belt along on the cones in increments that are constantly increasing.

By controlling the varying increments of the belt movements, the effect is similar to having a large family of cones of variable sizes and shapes. The effect is also similar to having a large number of tension gears with fractional tooth differences which could be automatically introduced into the belt shipper gear-train starting with a low-tooth tension gear and gradually increasing the number of gear teeth as the roving package is wound.

A schematic diagram of the ITT roving winding tension regulator is shown in *Figure 8*. As the cam is rotated constant amounts, the cable pulls the belt-shipper variable amounts, which are determined by the distance the cam center is moved downward. The belt-shipper movements can be very small at the start but become progressively greater as the cam rotates. On the other hand, when the cam is on dead center the belt-shipper movements are equal. Thus, by off-setting the cam cen-

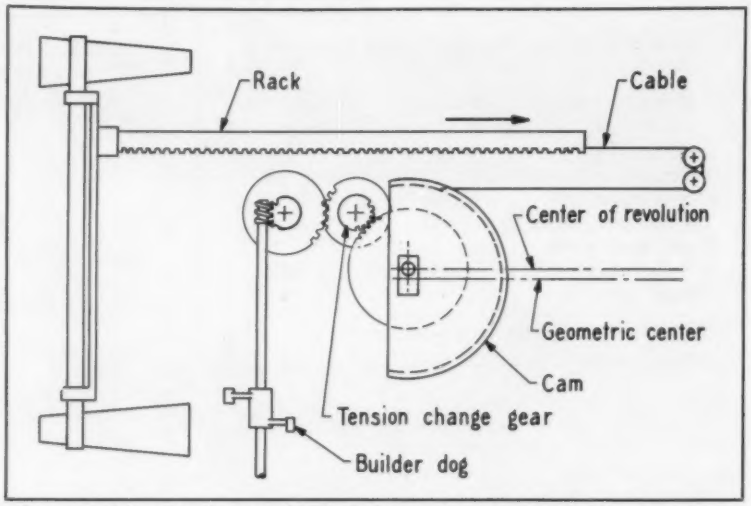


Figure 8. Schematic diagram of ITT winding tension control mechanism for roving.

TABLE 3. Properties of 26s Yarns Made From Roving Produced on a Roving Frame Equipped With the Winding Tension Regulator and Variable-Pitch Builder

	Standard	ITT*
Break factor adjusted to 26s yarn	2060	2006
Single-end strength, g/tex	14.5	14.5
Single-end elongation, %	6	6
Uniformity, NU, %	109	110

*Winding tension regulator plus variable-pitch builder

ter, the belt-shipper movements can be adjusted to much better suit particular roving requirements and the roving can be wound as tight as the roving strength will permit. Obviously, different profile cams can be made to correct even very faulty cone designs.

The roving winding tension control mechanism has now been mill-tested for over nine months and a commercial model is being built. The gains realized with this winding tension control mechanism, without increasing tension breaks, over-runs, or causing any significant changes in roving quality have been substantial. The decreased density variation throughout the package when using the ITT roving winding tension regulator is shown in *Figure 7.*

The results and gains made on a 12 x 6 roving frame using the roving winding tension control mechanism versus standard operation are shown in *Table 2.* Winding the roving under high tension has not shown, after many exhaustive tests, any adverse change in the quality of the roving, or of the yarns produced *(Table 3).*

Some of the advantages in spinning of using the roving winding tension regulator and variable-pitch builder are: (a) heavier roving packages permit less creeling per work cycle; (b) creel breaks resulting from roving over-runs are practically ended; (c) less piecing up required of the spinner; and (d) better machine efficiency is possible and more machines can be controlled by the spinner.

Summary. The Institute has pioneered in high tension roving winding studies and developed both the roving frame variable-pitch builder and the winding tension regulator mechanism.

In actual mill tests, conventional roving frames modified by installing the variable-pitch builder and the winding tension regulator mechanism have shown the following beneficial results:

1. Roving-package weight gains of 20 to 60 per cent.
2. Permits more spinning frames to be added without increasing the number of roving frames.
3. Change-over to larger-size roving packages may not be necessary to get more production.
4. High-quality control with fewer over-runs and tension breaks.
5. Less labor in roving and spinning required and a smaller (bare) bobbin inventory.
6. Roving packages remain more stable during handling.
7. The cost of these devices may be amortized in one year, or less, as a result of the reduction in cost to produce a pound of yarn.

Recent developments in roving frame design

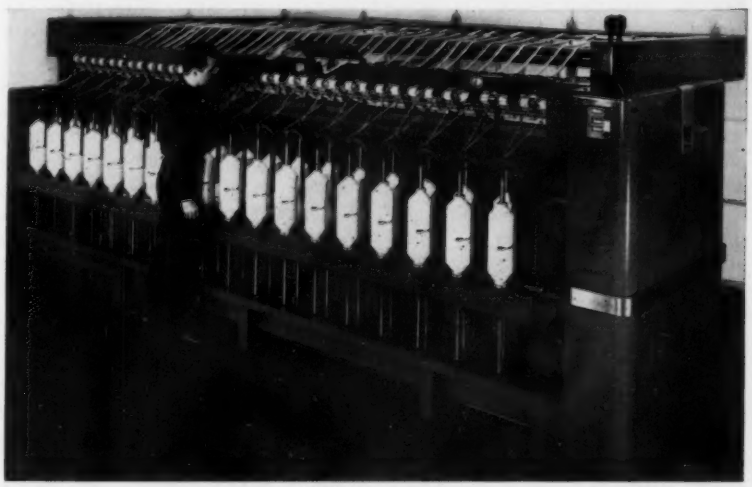
by Carl D. Brandt
Whitin Machine Works

SINCE the introduction of long draft on roving frames about thirty years ago, very little of importance has been done to the frame itself. Flyer speed and package size have been the factors that limited production. Accepted as standard over the years has been the following:

Size In.	Flyer RPM	Net Wt Oz
12 x 6	660	46
10 x 5	900	27
8 x 4	1200	16

It therefore became necessary to assign each different roving to that frame on which it could be produced most economically.

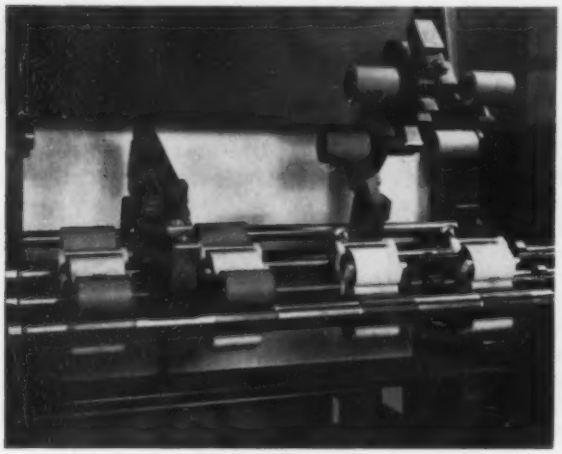
Today, with the general adoption of longer drafts in spinning, the trend has been toward the use of coarser hanks of roving. A second factor that has influenced this swing to coarser rovings has been the extended use of single-creel roving on the spinning frame.



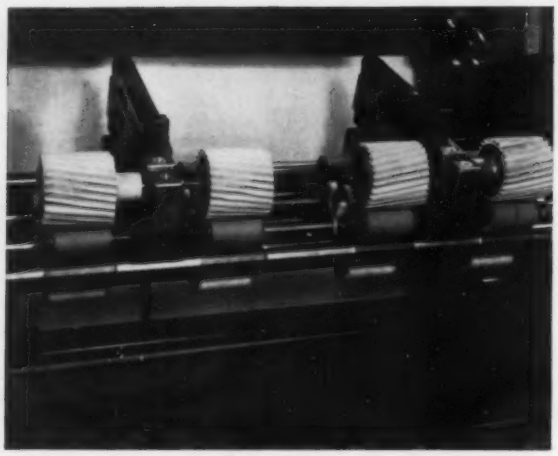
The Model P roving frame.

Consequently, there is a very definite need now for a frame that will produce a large package at a high speed, and with this as a basis, a new frame—the Model "P"— has been built.

Before any actual work could be started a number of assumptions and limitations had to be made. In this instance the bobbin was to be 14″ x 7″ and the space 10¼″; the flyer speed to be up to 1200 rpm; and the drafting range to allow roving up to 1.5 hank to be made. One will realize that this is extreme flexibility,



Drafting roll system



Drafting unit

a condition that is so necessary for efficient mill operation today.

Designing the Flyer. Spindle speed is almost entirely dependent upon flyer construction so, therefore, some new type of flyer with built-in stiffness became the first requisite.

Since there are available many materials with the inherent qualities necessary to meet these requirements, the problem became one of design and manufacture. The technical progress made during the last few years placed at hand methods that simplified the task to be done. Balancing the flyers at high speeds becomes much more difficult than formerly and care must be taken that there are no critical periods of unbalance.

High speed photography allowed observations to be made under actual operating conditions covering a wide range of speeds. Minor faults were quickly spotted and the effects of corrective measures carefully observed. Other modern devices, such as electronic balancers for instance, helped to make the solution of many problems, which in years past were quite difficult, rather simple.

Other Design Requirements. Due to the increased size and weight of the flyer and roving bobbin, a more substantial spindle and bolster are required. Spindle whip and vibration, especially when the bobbin rail is at its lowest position, must be kept at a minimum. This condition is met by enlarging both the spindle and the bolster and supplying the proper bearing surfaces for support of heavier loads running at high speed. The spindle step is provided with an oil reservoir in order to reduce the need for frequent lubrication.

A smooth-running bobbin rail with substantial support must be provided if well-built bobbins are to be produced. There can be no hesitation, otherwise there will be ridgy bobbins and run-overs. Stationary rods attached to the sampsons support the lifter racks which are constructed with Oilite inserts.

Thus, with a properly leveled frame a free and smooth traversing movement is obtained along with a minimum of vibration in both the spindle and bolster. Counterbalance for the rail is supplied by springs working over the surface of a cam which corrects for the varying effort of the spring as it is stretched. Of course, the total counterbalance force can be adjusted for varying mill requirements. Then, by means of an arm, the lifting force is applied directly under the center of the bobbin rail.

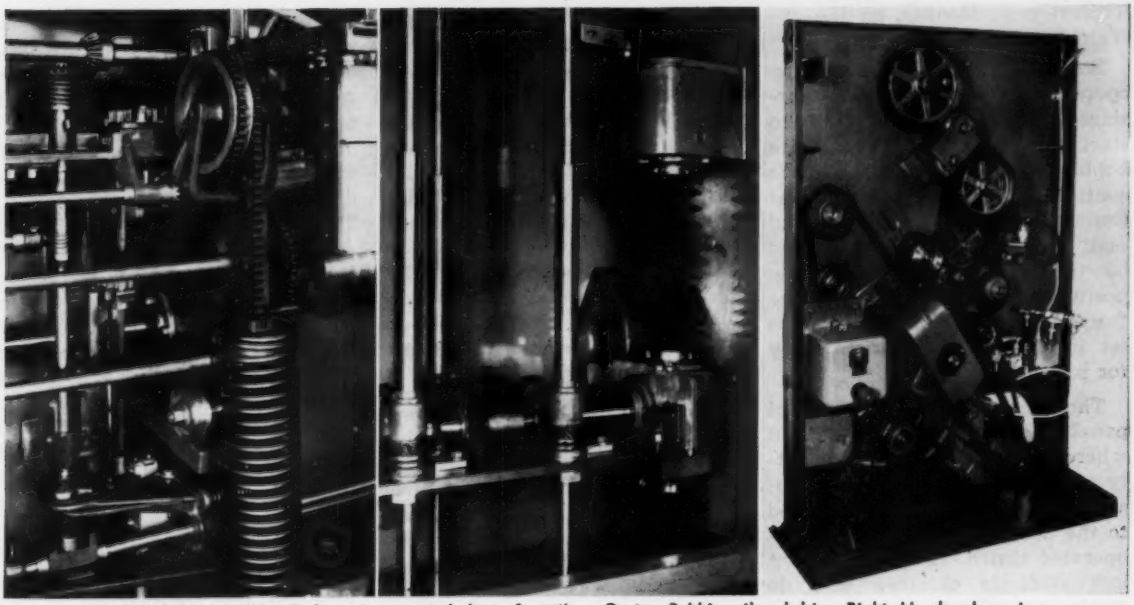
The bobbin drive no longer makes use of the old conventional horse head as it is well known that this introduces creep as the rail rises and falls. Instead, the two rows of bobbin gears are driven by a common shaft which receives its power from a vertical splined shaft. Helical cut gears are used to provide an efficient and quiet running drive when operating at high speeds.

Roving-Bobbin Weight. The aim and object of all of these refinements is to put an optimum weight of roving on the bobbin. Under ideal conditions it is impractical to run a density of more than 120 grains per cubic inch of volume. Since a 14" x 7" bobbin will represent approximately 385 cubic inches, it means at best that the theoretical maximum full bobbin weight will be about 105 ounces.

Due to variables in the sliver creeled at the back of the frame, it is often impractical to attempt to attain this weight. Under normal operating conditions a net weight of approximately six pounds should be quite acceptable. This means that a 96-spindle frame will produce roving in total weight better than the equivalent of a bale of cotton at each doff. Everyone realizes that there are very definite advantages to be gained by producing heavy roving bobbins.

The length of time between doffs at the roving frame and the reduction in creeling at the spinning frame are factors that must be carefully considered. When making a normal 1.0-hank roving, the production per spindle per hour will be 1.65 pounds. On this basis, a single 96-spindle frame will produce sufficient roving to keep 5000 spindles on 30s yarn in continuous production.

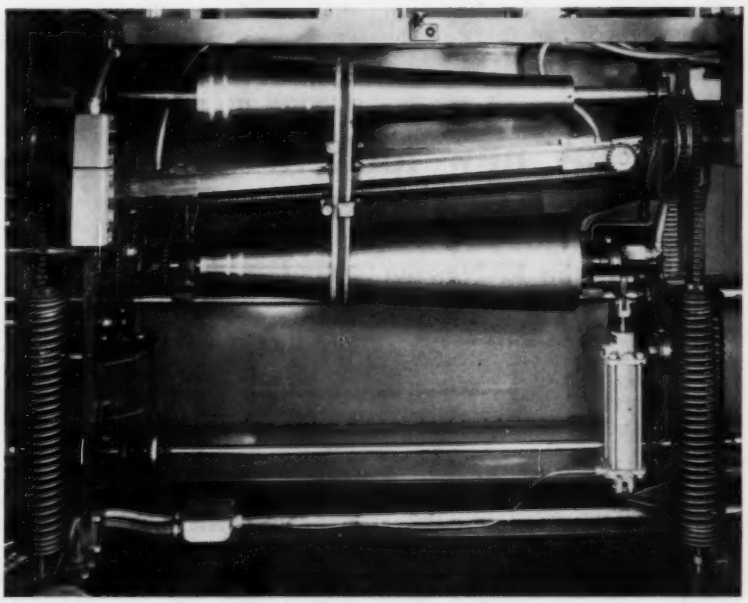
Today there is a decided trend



Left: Builder and tumbler shaft; spring counterbalance for rail. Center: Bobbin rail and drive. Right: Head-end gearing.

toward the high-density package. In the old days if one obtained a roving bobbin that had a density of 85 grains per cubic inch all was well. That condition is no longer acceptable; over a relatively short period of time this compactness has been increased so that today it runs about 50% greater than formerly. As a result, the matter of tension becomes much more critical. There is no longer any "give and take" at the bobbin and consequently take-up tension must be very exact. This tension must be applied at the presser pad since any carry through to the section of roving between the flyer top and the front roll will cause unevenness. Various means are used to localize the increased tension at the presser, one of the simplest is the extra wrap around the presser leg.

Cones are used to provide the proper winding speed to the bobbin. If they are turned to the proper outline they serve as the simplest and most trouble-free means of regulation. Due to the increased load resulting from the larger and heavier bobbins, the size and weight of both cones have been increased and contours electronically checked.



Cones on the Model P roving frame

Other Features. Many of the operating elements of the new frame have been relocated. The head end now becomes the center of operation since it contains most of the driven components. Here one will find the twist, lay, and tension change gears. The section man will no longer find it necessary to crawl around or in back of the frame to make gear changes. The saving in time and the matter of convenience should be greatly appreciated by the operator.

Another feature that saves the operator time and trouble is the automatic windback of the cone belt at the end of the doff. When the doff has run to completion the bottom cone is raised, slack run in the roving at the top of the flyer, and the cone belt reset to the starting position. All this is done

without any attention on the operator's part.

The doffing cycle is not set into operation at the end of the carriage stroke but is delayed to start at any chosen point along the bobbin length. The means for this control are located in a special timing box located in the head end. A second function performed by the same mechanism is the positioning of the flyers when the frame is stopped. They are always set in the proper position ready for piecing up.

The main electrical control panel is located in the foot end where all elements are conveniently accessible. The motor runs constantly and power is transmitted to the drive shaft through an air-operated clutch. In this manner a soft start is obtained and no strains are placed on the various parts as the frame builds up to full operating speed.

General construction has been much improved and many of the new mechanical features incorporated will result in better operation with less attention on the part of the operator. Ball and roller bearings are used extensively and are applied to those points where they serve a useful purpose; as for example, on all shafts in the differential, on head-end studs, and the three lines of bottom rolls in the drafting section. All roller chain drives used are of the self-lubricating type which require attention only when the frames are generally scoured.

Provision has been made to apply the regular cotton drafting systems. The modern systems of top arm suspension make use of antifriction top rolls. When used with ball bearing bottom rolls, oiling is completely eliminated and therefore cleaning becomes a much simpler problem.

It is only natural that fly waste increases as frame speeds and drafts are increased; consequently, any reasonable means that will make cleaning a simpler operation will certainly be worthwhile. Means are provided for the application of any system of broken end and waste collection.

Conventional full-bobbin and traverse-overrun stop motions are also incorporated in the design. The frame can be stopped, started, and jogged by switches conveniently located along the frame.

The point of diminishing return is fast being reached in many of the manufacturing operations. Can size and package capacity must be adjusted to floor space and creel requirements. It could well be that a point is being reached where further increases are not warranted and are no longer economically justified. Operating speed is limited by the physical characteristics of the stock being run and the construction of the mechanical elements comprising the machine itself. When, where, and how the limits of these parameters will be reached, time alone will tell.

A new look at cotton quality relationships

by Franklin E. Newton
Cotton Technologist
U. S. Department of Agriculture[1]

INTRODUCTION

WE NEED to define clearly those properties of cotton which are significantly related to its use-value. We need fast, repeatable, precise methods for measuring these properties. We need to define and measure the properties required for efficient spinning and weaving to obtain high quality in manufactured products. We must have a better understanding of the relationships between the properties of the raw material, manufacturing performance, and finished product quality.

In this report we undertake to make a contribution to the understanding of quality evaluation by reporting relationships between available fiber property measurements and various tests of spinning performance and product quality. We do this by examining the relationships between the fiber property measurements and processing and spinning tests that have been made by the Cotton Division since 1946.

Tests currently made in the USDA cotton laboratories either routinely, or for special purposes, are listed in *Table 1*. Practically all of them are made on every sample submitted for a spinning test. Data on some of these properties, particularly on short fibers and ends-down at spinning are at present virtually unavailable. We realize that other fiber properties that we do not now measure may be important, but these we either do not yet know how to measure, or how to measure satisfactorily.

Cotton quality, as an over-all measure, has never yet been defined satisfactorily; usually one factor of quality receives particular emphasis. Sometimes yarn strength is emphasized, sometimes it is yarn appearance, sometimes manufacturing waste. Each of these is dependent on many measurable raw cotton properties. In our laboratory testing program (1, 2)[2] we have considered the following five measures as indicative of processing and product quality: (1) per cent manufacturing waste, (2) yarn strength, (3) yarn appearance, (4) color of bleached yarn, and (5) color of dyed yarn. We report here the relation of each of these five measures to the properties we have tested. These results are in addition to those included in the Webb-Richardson series of reports published since 1945, for which a full list is contained in Webb's most recent report (3).

[1]Standardization Section, Standards and Testing Branch, Cotton Division, Agricultural Marketing Service.

[2]Numbers in parentheses designate references at the end of the paper.

SOURCE OF COTTONS USED IN TESTS

All analyses in this report are based on test results for modal qualities of American Upland cottons, as published in Annual Quality Studies, 1946-58 (4-17) and on test results in our files for full ranges of grades and staples in 1956 and 1959-60 studies of standards bales[3].

Sampling. For the Annual Quality Studies, classer's samples of the same grade and staple are assembled at the U. S. Department of Agriculture classing offices from selected commercial gins at different intervals during the harvesting season. These samples represent the modal grade and staple at the time of selection and are composited into 6- to 8-pound spinning lots; therefore, the range in the qualities of spinning lots for each year is not the same. Because of this varied distribution, correlation coefficients are not necessarily comparable from year to year.

For the studies of standards bales, each spinning lot represents an individual bale purchased by the U. S. Department of Agriculture for use in the grade and staple standards. The 1956 study of grade standards consists of a complete range of white and colored grades but the 1959 study reported here includes results for white grades only. The 1959 study of staple standards consists of a complete range of staples for the American Upland scale.

METHOD OF PROCESSING

Small-scale spinning tests, made at the Cotton Division's spinning laboratories according to previously developed standard procedures, provide the fiber and processing results for each study, 1946 through 1958.

From 1946 to 1949, all staples were carded at 9½ pounds per hour using the same organizational setup in the spinning laboratory. From 1950 to date, only the medium staples were carded at this rate. Even though the range of staples varied considerably for some studies, all cottons covered in this report were carded at 9½ pounds per hour and with essentially the same standard procedures.

[3]Since 1938, full fiber and spinning tests are routinely made on all bales bought for use in grade and staple standards.

TABLE 1. List of Tests Currently Being Made in USDA Cotton Classing Rooms and Laboratories, Either Routinely, or for Special Purposes

Property Measured	Type of Test	Method of Determination
	TESTS OF RAW COTTON	
Length	Staple	Classer's pull
	Length, and length distribution e.g., UQL, C.V., short fibers	Suter-Webb sorter
	Length, and length uniformity e.g., UHM, UR, short fibers	Fibrograph
Color	Grade, raw stock	Visually by classer
	Color, raw stock	Cotton Colorimeter
	Color, cleaned lint	Cotton Colorimeter
Foreign Matter	Grade, raw stock	Visually by Classer
	Nonlint content	Shirley Analyzer
	Nonlint content	Fractionator (ACCO)
	Relative surface leaf area and count	Trashmeter
Strength	Flat bundle of fibers[1]	Pressley, 0" and ⅛" Gauge
Fineness	Linear density (wt/in.)	Array method
	Resistance to air flow	Micronaire and similar commercial instruments
Maturity	Cell-wall development	Array method-microscopic
	Cell-wall development	Causticaire
Neps	Count	Visual
Physical-chemical	Per cent soluble sugar	Chemical-colorimetric
	Acid-alkiline	pH meter
	Moisture regain	Oven test
	Moisture content	Moisure meters
	TESTS DURING PROCESSING	
Waste	Per cent, raw stock	Weight at picker and card
Neps	Count in card web	Visual
Performance	Ends-down	No./2,000 spindle hours
	Spinning potential	No./200 spindle hours
	TESTS OF MANUFACTURED PRODUCT	
Strength	Skein test on grey and mercerized yarn	Pendulum skein tester
	Single strand, grey yarn	Automatic pendulum tester
Irregularity of yarn	Appearance	Visual, against ASTM yarn appearance standards
	Count of imperfections	Imperfection counters
Color	Color—grey, bleached, and dyed yarn	Color-difference meter
Luster	Luster, grey and mercerized yarn	Lustermeter

[1]Preceded by Chandler bundle test, developed by Dr. E. E. Chandler in 1926 for use in the Cotton Division's early testing program.

METHOD OF ANALYSIS

Fast and economical statistical analysis of a large amount of data, accumulated over the past several years, has been made possible through use of electronic data pro-

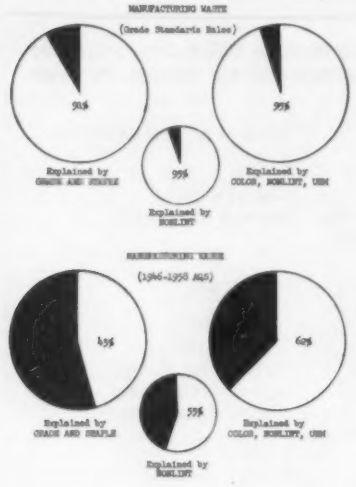


Figure 1. Variation in *manufacturing waste* explained by grade and staple; by color, Shirley Analyzer nonlint, and UHM; and by Shirley Analyzer nonlint only. Based on test results for 1956 and 1959-60 studies on grade standards (above), and on samples in Annual Quality Studies, 1946-58 (below).

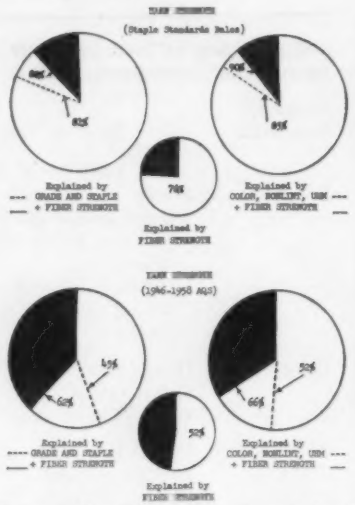


Figure 2. Variation in *yarn strength* (22s) explained by grade and staple; by color, Shirley Analyzer nonlint, and UHM; by fiber strength added to each; and by fiber strength only. Based on test results for 1956 and 1959-60 studies on staple standards (above), and on samples in Annual Quality Studies, 1946-58 (below).

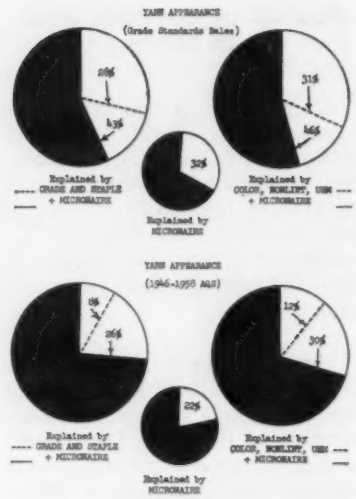


Figure 3. Variation in *yarn appearance* (22s) explained by grade and staple; by color, Shirley Analyzer nonlint, and UHM; by Micronaire added to each; and by Micronaire only. Based on test results for 1956 and 1959-60 studies on grade standards (above), and on samples in Annual Quality Studies, 1946-58 (below).

cessing equipment.

During the past two years 20 complete statistical studies have been made that include approximately 5,000 spinning lots and cover nearly all tests made in the years 1946-58. These studies have resulted in over 20,000 simple correlations. This number is large because every measured property was purposely included as a variable, and the computer automatically calculated simple correlation coefficients for each variable.

These simple correlation coefficients have been obtained for use with a computer program designed to provide multiple correlation coefficients, beta values, partial correlation coefficients, and regression equations. By use of this program, any number of variables up to a total of eight can be selected and the simple correlations for them can be fed back to the computer in order to obtain statistical values for the multiple relationships. Use of electronic equipment has thus increased our pace considerably in evaluating fiber and spinning properties.

RESULTS

Throughout this report variation is explained for five selected cotton quality factors in terms of parallel sets of measures: (1) classer's grade and staple; (2) color, Shirley Analyzer nonlint, and Fibrograph UHM (the laboratory measures most nearly equivalent to grade and staple); (3) a single fiber property found important in contributing to the total variation that is explained; (4) this single property, added as a supplement to classing and laboratory measures, when its addition significantly increases the explained variation.

The variation reported in *Figures 1* to *5* is in terms of per cent variance, obtained by squaring the correlation coefficients for each study and averaging them. These average results are presented. We expect to publish details for the individual studies, including additional related data, in the very near future.

Manufacturing Waste, Figure 1. When the cottons studied are distributed over a complete range of grades, the variation in manufacturing waste explained by the classer's grade and staple is 91%, by laboratory measures of color, nonlint, and UHM, 95%; by the one measure of Shirley Analyzer nonlint, 95%.

When the cottons studied are restricted to modal grades and staples, as in the Annual Quality Studies, the variation in manufacturing waste that is explained decreased sharply; 45% is explained by the classer; 62% by the laboratory tests of color, nonlint, and UHM; and 55% by the single test of Shirley Analyzer nonlint.

Yarn Strength, Figure 2. For cottons distributed over a complete range of staples, the variation in yarn strength explained by classer's grade and staple is 81%; by laboratory measures of color, nonlint, and UHM, 85%; by fiber strength (Pressley ⅛" gauge), 76%. Adding fiber strength as a supplementary measure to the classer's grade and staple, and to the laboratory measures of color, nonlint, UHM, increases the variation explained to 88% and 90%, respectively.

When the cottons studied are restricted to modal grades and staples, the variation in yarn strength explained by grade and staple is 45%; by laboratory measures of color, nonlint, UHM, 52%; and by fiber strength alone, 52%. Including fiber strength (Pressley ⅛" gauge) with the above combinations, increases the variation explained to 62% and 66%.

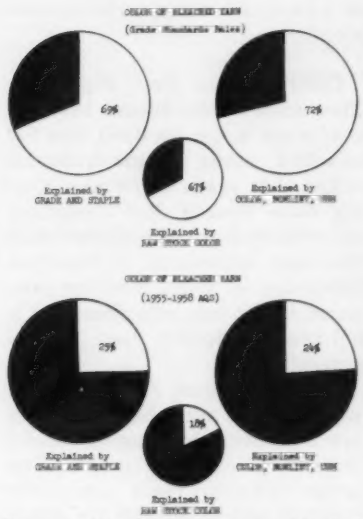


Figure 4. Variation in *color of bleached yarn* explained by grade and staple; by color, Shirley Analyzer nonlint, and UHM; and by raw stock color (R_d and + b) only. Based on test results for 1956 and 1959-60 studies of grade standards (above), and in samples in Annual Quality Studies, 1955-58 (below).

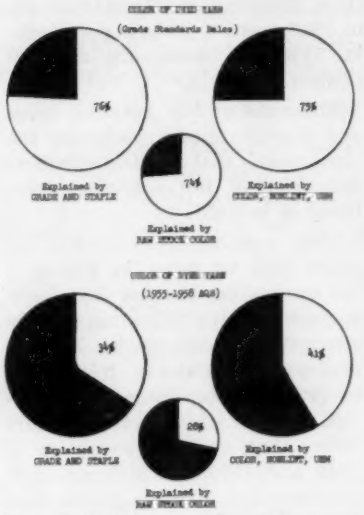


Figure 5. Variation in *color of dyed yarn* explained by grade and staple; by color, Shirley Analyzer nonlint, and UHM; and by raw stock color (R_d and + b) only. Based on test results for modal qualities of American Upland cottons, as published in Annual Quality Studies, 1946, 1952, and 1958.

Yarn Appearance, Figure 3. For cottons distributed over a complete range of grades, variation in yarn appearance explained by grade and staple is 28%; by laboratory measures of color, nonlint, UHM, 31%; by Micronaire alone, 32%. Adding Micronaire to the above combination of variables increases the variation explained to 43% and 46%.

When the cottons are restricted to modal grades and staples, variation in yarn appearance explained by classer's grade and staple is 8%; by laboratory measures of color, nonlint, UHM, 12%; Micronaire alone, 22%. Adding Micronaire to the above combinations increases the variation explained to 26% and 30%.

As shown by these results, neither classification nor laboratory measures of color, nonlint, and UHM, even when supplemented by Micronaire, explain much about yarn appearance. The range of Micronaire readings for samples used in these tests is restricted. If a wider range were used, then perhaps Micronaire could explain more variation in yarn appearance; unpublished data in our files indicate that as Micronaire readings decrease from around 3.0, yarn appearance rapidly decreases.

Color of Bleached Yarn, Figure 4. For cottons distributed over a complete range of grades, variation in color of bleached yarn explained by grade and staple is 69%; by laboratory measures of color, nonlint, UHM, 72%; by raw stock color alone, 67%.

For the more limited range of grades in the Annual Quality Studies, the variation in the color of bleached yarn explained by grade and staple is 25%; by laboratory measures of color, nonlint, UHM, it is 24%; by raw stock color alone, 18%.

Color of Dyed Yarn, Figure 5. For cottons distributed over the entire range of white grades, variation in color of dyed yarn explained by grade and staple is 76%; by laboratory measures of color, nonlint, UHM, 75%; by raw stock color alone, 74%.

For the more restricted range of grades, variation in color of dyed yarn explained by grade and staple is 34%; by laboratory measures, 41%; by raw stock color alone, 28%.

To compare trends and relative levels of classing and laboratory results, regression equations for the data were studied. All years were included, but to simplify the diagrams to be presented, only the results for every sixth year are included in *Figures 6* to *11*.

Manufacturing Waste, Figure 6. Manufacturing waste for the 1958 crop by classer's grade is approximately 1½ percentage points lower for each grade than for the 1946 crop. In 1952 the amount of waste seems less in the higher grades, more in the lower grades than either 1946 and 1958.

On the other hand, the relationship between manufacturing waste and the laboratory measure of Shirley Analyzer nonlint content seems to show no significant change over the years.

Yarn Strength, Figure 7 (Grade Varying) and Figure 8 (Staple Varying). In early years, the differences in yarn strength between grades, holding staple constant, were very small *(Figure 7)*, but in 1958 the differences were large. The strength difference between

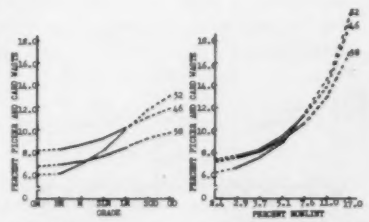


Figure 6. Regression equations plotted for *manufacturing waste*, using grade and staple as variables with staple constant; color, Shirley Analyzer nonlint, and UHM as variables with color and UHM constant. Based on test results for modal qualities of American Upland cottons, as published in Annual Quality Studies, 1946, 1952, and 1958.

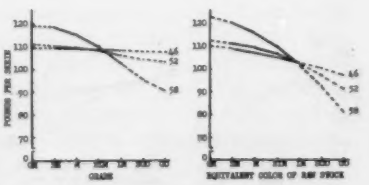


Figure 7. Regression equations plotted for *yarn strength*, using grade and staple as variables with staple constant; color, Shirley Analyzer nonlint, and UHM as variables with nonlint and UHM constant. Based on test results for modal qualities of American Upland cottons, as published in Annual Quality Studies, 1946, 1952, and 1958.

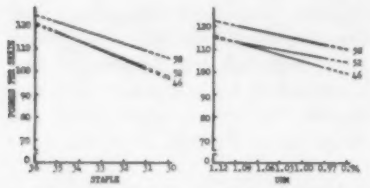


Figure 8. Regression equations plotted for *yarn strength*, using grade and staple as variables with grade constant; color, Shirley Analyzer nonlint, and UHM as variables with color and nonlint constant. Based on test results for modal qualities of American Upland cottons, as published in Annual Quality Studies, 1946, 1952, and 1958.

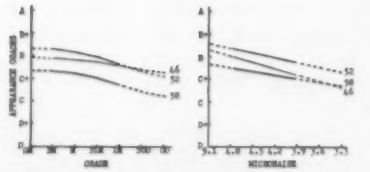


Figure 9. Regression equations plotted for *yarn appearance*, using grade and staple as variables with staple constant; grade and staple with Micronaire as variables with grade and staple constant. Based on test results for modal qualities of American Upland cottons as published in Annual Quality Studies, 1946, 1952, 1958.

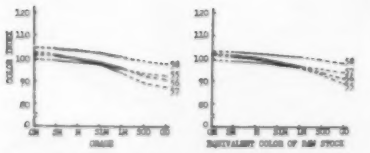


Figure 10. Regression equations plotted for *bleached yarn*, using grade and staple as variables with staple constant; color, Shirley Analyzer nonlint, and UHM as variables with UHM and nonlint constant. Based on test results for modal qualities of American Upland cottons, as published in Annual Quality Studies, 1955-58.

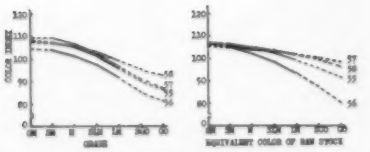


Figure 11. Regression equations plotted for *dyed yarn*, using grade and staple as variables with staple constant; color, Shirley Analyzer nonlint, and UHM as variables with UHM and nonlint constant. Based on test results for modal qualities of American Upland cottons, as published in Annual Quality Studies, 1955-58.

Good Middling and Good Ordinary in 1946 was 1½ pounds per skein; in 1958 the difference was 29 pounds per skein.

The relationship between color and strength shows practically the same trend, that is, little relationship in 1946, but a distinct relationship in 1958.

The relationships shown by grade and by color in *Figure 7* are misleading because they seem to show that the difference in yarn strength between grades has increased progressively from 1946 to 1958. A comparison of regression lines for intervening years shows that, with the exception of 1949 and 1950, the differences in yarn strength between grades have been increasing gradually since 1946. There is no significant difference between grades for 1949, 1950, and 1958, although the level of yarn strength was higher in 1958 than in 1949 or 1950.

When classer's staple, holding grade constant *(Figure 8)*, is studied as a variable in explaining yarn strength, in addition to the obvious fact that longer staples usually make stronger yarns, it appears that in 1958 yarns made from the same lengths were stronger than in earlier years. The Fibrograph UHM shows the same trends.

Yarn Appearance, Figure 9. The regression lines show very little difference in yarn appearance between grades. This supports the conclusion based on *Figure 3* that there never has been much relationship between appearance and grade. Appearance seems to be about one-fourth grade lower in 1958 than in 1946 for the same grade. Similarly, for the same Micronaire readings, appearance is lower in 1958 than in earlier years.

Color of Bleached Yarn, Figure 10. The Cotton Division did not begin finishing tests until 1955. Results for 1955-1958 show that yarns bleach whiter for higher than for lower grades, and that results for each year are essentially the same, with the exception that the 1958 crop seems to have bleached somewhat whiter than the other years, whether judged on a basis of classing or laboratory measures.

Color of Dyed Yarn, Figure 11. The color differences between grades are larger for dyed than for bleached yarns, which indicates either that grade influences dyeing more than it does bleaching, or—what seems more likely—that the color differences in bleached yarns are so small that the precision of the test measurements is not adequate to pick them up consistently.

It is clear from *Figure 11* that yarns made from higher grades dye a deeper color (higher index) than those of lower grades. The levels between years are fairly constant, except for 1956 for which results are somewhat lower, whether judged by classing or by laboratory measures.

COMPARATIVE COSTS OF TESTING

Instrument testing, when it can be done by precision methods and repeated within very close tolerances, has certain advantages over visual or manual testing whether that testing is performed by a classer or by laboratory personnel. However, the lack of precision for many of our present laboratory test methods must be faced and improved before instrumentation can possibly be expected to do more than supplement visual and manual testing. But if instrumentation *were* adequate in this regard, let us take a look at the costs involved in classification versus laboratory testing *(Table 2)*.

Classer's grade and staple costs 25 cents, similar laboratory measures cost $3.75 if a sufficient number of test per sample are performed to obtain reliable results. By reducing the number of tests per sample and performing the tests more economically, these costs can be reduced to approximately $1.30 but the accuracy of instrument testing would be greatly reduced. The Micronaire and Pressley tests would cost an additional 30 cents for a small number of tests per sample. If the number of Fibrograph and Pressley tests are reduced to one per sample, the accuracy of testing

TABLE 2. Estimate of Costs Involved for Classification, for Instrument Testing by Laboratory, and by Volume Testing

Classification		Instruments Tests				
			Laboratory Testing		Volume Testing	
Determination By	Cost	Determination By	Number of Tests	Estimated Cost	Number of Tests	Estimated Cost
Grade and staple	$0.25	Colorimeter	1	$0.25	1	$0.05
		Fibrograph	4	1.50	1	0.25
		Shirley Analyzer	1	2.00	1	1.00
Subtotal	0.25		6	3.75	3	1.30
		Micronaire	2	0.75	1	0.05
		Pressley	6	1.50	1	0.25
Total	$0.25		14	$6.00	5	$1.60

would be greatly reduced. In fact, if the testing for color, nonlint content, and fineness are performed at speeds which would reduce the cost as outlined in *Table 2*, accuracy would be sacrificed to a certain extent.

No doubt the cost of some of these laboratory tests can be reduced when performed on a production basis or when performed by use of new developments for testing. For example, Dr. Earl E. Berkley is in the process of developing a Fractionator which measures essentially the same thing as the Shirley Analyzer, but at a much faster rate. But until faster methods for length and strength determinations are developed, the laboratory cannot hope to match classing costs to give the same amount of information.

Regardless of the cost involved, laboratory tests are important and are included both in developing and maintaining standards for grade and staple, and as an aid in determining the accuracy and level of cotton classification. Bales are selected for use in the standards only when they meet both classing and laboratory specifications.

TESTS FOR FUTURE ANALYSIS

We do not know what relationships would be discovered if a spinning performance or ends-down test could have been added to the five quality measures used as a basis for the studies reported, but we hope that within the next year spinning performance tests will be included in our statistical studies as a sixth dependent variable. By incorporating in 1960 a spinning potential test into the regular testing program of the Cotton Division, we shall have available data on the 1960 crop results on which to make statistical studies of the relationship between various fiber properties and the spinning performance. Beginning with the 1959 crop we are including a measure for "short fibers" in our computer program. These and other relationship studies will be made available as they are completed.

SUMMARY AND CONCLUSIONS

One factor alone explains most of the variance for each of the following: manufacturing waste, yarn strength, yarn appearance, color of bleached yarn, and color of dyed yarn. When that factor is a part of the classer's "grade and staple," or of the laboratory's measures that are similar to "grade and staple," then the results are all approximately the same. When the explanation is related to a factor not included in standards for grade and staple, then additional tests are needed in order to provide a better prediction of the quality measure that is deemed important *(Figures 1 to 5)*.

For the full range of grades or staples in the standards bales, there is very little difference between the amount of variation explained by the classer and that explained by laboratory measures that are similar to grade and staple *(Table 3)*. In the Annual Quality Studies, with a considerably restricted range of grades and staples, the explained variation is lower than for the more complete range of the standards, yet the differences between the variation explained by the classer and by similar laboratory measures are relatively on the same level.

Regression lines illustrated by *Figures 6 to 11* indicate: (1) that waste is less for the same grades in 1958 than in 1946, but that over the years the relationship between waste and Shirley Analyzer nonlint has remained nearly constant; (2) that differences in yarn strength between grades have increased gradually since 1946 (with exceptions in 1949 and 1950), that this gradual trend of change is confirmed by the relationships shown between yarn strength and color, and that yarns made from the same lengths are stronger in 1958 than in earlier years, whether measured by classer or laboratory; (3) that appearance of yarn is slightly lower in 1958 than in earlier years for the same grades and same Micronaire readings; (4) that yarns bleach whiter for high-

TABLE 3. Variation for Five Cotton Quality Measures Explained by Classification, by Equivalent Laboratory Tests, and by Supplemental Laboratory Tests[1]

Quality Measure	Per Cent Variance Explained By: Grade and Staple	Color Nonlint UHM	One Measure	Grade and Staple[2]	Color Nonlint UHM[2]
BASED ON STANDARDS BALES (FULL RANGE OF GRADES OR STAPLES)					
Mfg waste[3], %	91	95	95 Nonlint		
Yarn str[4]	81	85	76 Fiber str	88	90
Yarn appearance[3]	28	31	32 Micronaire	43	46
Bleached yarn col[3]	69	72	67 Raw stock col		
Dyed yarn col[3]	76	75	74 Raw stock col		
BASED ON ANNUAL QUALITY STUDIES (RESTRICTED RANGE OF GRADES AND STAPLES)					
Mfg waste	45	62	55 Nonlint		
Yarn str	45	52	52 Fiber str	62	65
Yarn appearance	8	12	22 Micronaire	26	30
Bleached yarn col	25	24	18 Raw stock col		
Dyed yarn col	34	41	28 Raw stock col		

[1]Summary of averages based on test results for studies on standard bales, and on sample in Annual Quality Studies.
[2]Plus supplemental measure.
[3]Based on grade standards bales.
[4]Based on staple standards bales.

er than for lower grades, and with one exception are on about the same level for all years, whether judged by classing or laboratory measures; (5) that the dyed yarn index shows a considerable relationship to grade, and to color, with only slightly different levels between years.

Based on comparative costs of testing, it seems clear that until more precise measurements can be made by laboratory instruments which are economically comparable to classification, the most practical approach is to use these tests in developing and maintaining standards, and as a supplement and aid to grade and staple classification. This is the use being made of laboratory tests by the Cotton Division in its standardization and classing program on an ever widening scale. In fact, much of the pioneering work in the development of fiber testing methods originated in the Department's cotton standardization laboratories. As far back as 1927 the Cotton Division established its fiber testing and color laboratories because, even then, they realized clearly that grade and staple do not explain sufficiently well the total contribution of various fiber properties to spinning performance and product quality of cotton.

The information presented today, based on tests made over the past 13 years, contributes to our understanding of quality evaluation by making it clear that grade and staple still provide a good "first approximation" to cotton quality evaluation, although they do not cover, nor have they ever covered, several of the important fiber properties needed to predict more fully the spinning quality or use-value of cotton.

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Effect of fabric structure on properties of wrinkle-resistant cottons

by Richard L. Arceneaux, J. David Reid, and E. Fred Schultz, Jr.[1]

Southern Regional Research Laboratory[2]

THE FINISHING of cotton fabrics to obtain wrinkle resistance properties for use in wash-wear garments is accompanied by undesirable changes in some important textile properties. Although advances in finishing technology have improved many properties, some property changes are still major problems with

[1]Biometrician, Biometrical Services, Agricultural Research Service.
[2]One of the laboratories of the Southern Utilization Research and Development Division, Agricultural Research Service, U. S. Department of Agriculture.

Summary

Twenty-three cotton fabrics varying in one or more structural parameters were treated with a wrinkle-resistance agent, dimethylol ethyleneurea (DMEU), and also with the agent in a formulated treatment. The effects of the structural variables on crease recovery angle, tearing strength, breaking strength, and resin distribution were studied.

Interactions of fabric properties with fabric direction necessitated a study of fabric properties on each direction rather than on the average or sum of both directions. The treatments tended to narrow the spread of crease recovery angle found in the untreated fabrics, bringing the crease recovery angle of each fabric closer to that typical of the treatment.

The use of fancy rather than plain weaves caused an improvement in tearing strength properties. The use of coarser yarns also improved tearing strength properties.

Distribution of resin content between warp and filling yarns was affected by variations in yarn twist multiplier. Breaking strengths of the various fabrics were not greatly affected by the structural variations in the fabrics.

many fabrics. It is the purpose of this paper to present some results of a brief and preliminary investigation of the effects of change in fabric structure on the properties of wash-wear cotton fabrics.

Reduced tearing strength is one of the major defects of wash-wear cotton. Nuessle (5, 6)[3] has pointed out that loose weaves retain more tearing strength than tight weaves and, although stronger fabrics generally remain stronger after treatment, some fabrics on treatment lose a greater proportion of their strength than others.

In a recent article Reid and coworkers (7) reviewed some of the problems of fabric structure. They pointed out that although there are only a limited amount of published data in this area of textile research there was some evidence of small constructional changes being made to improve wash-wear cotton now being marketed. Among the opportunities for further improvement in wash-wear cotton they consider the development of improved fabric structures suited for wash-wear treatment particularly promising. The selection of the best suited cotton fiber, optimum yarn number and twist, and proper fabric geometry are mentioned as being of major importance. The most serious obstacle as seen by these authors to the development of ideal wash-wear fabrics is the barrier of idealized structure versus tradition and style. There is a pronounced tendency on the part of the weaver to retain traditional weaves, tightness of twist and so forth, which may be optimum for untreated cotton, without regard for the fact that the structure is probably not optimum after the fabric has been made wrinkle resistant.

It is hoped that publication of the present data may promote interest and research in the area of the effect of construction on the properties of wrinkle-resistant fabrics, and that it will show the need for the design of new fabric structures.

[3]Numbers in parentheses designate references at the end of the paper.

MATERIALS AND METHODS

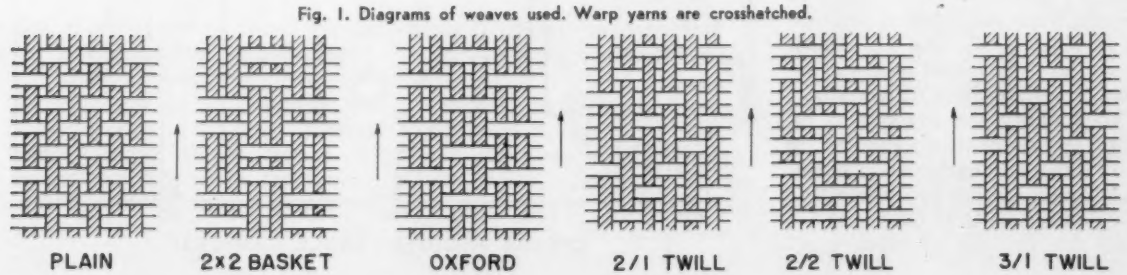
The 23 fabrics used in this study had been previously prepared and used for a contract study on draping qualities (3). The fabrics were made from Deltapine 15 cotton (staple length, 1 3/32") and were singed, desized, kier-boiled, and bleached. Geometric parameters which were varied in the fabric are given in *Table 1*. Diagrams of the weaves used are presented in *Figure 1*.

Wrinkle-resistant samples of each fabric were prepared using two treating solutions. Solution A consisted of 9% dimethylol ethyleneurea (DMEU) with 0.5% zinc nitrate catalyst. Solution B contained 7% dimethylol ethyleneurea, 0.5% zinc nitrate catalyst, 1.75% acrylate emulsion, 0.8% silicone emulsion, 0.4% silicone catalyst and 0.1% wetting agent. All reagents used were commercial products.

Type A solution was selected to observe the effect of the crosslinking agent alone, while Type B solution (formulated) is representative of a commercial treatment containing a thermoplastic additive to increase tearing strength, crease recovery angle, and wash-wear properties.

The fabric samples were prepared by padding with the solution to a wet add-on of approximately 80%, drying, and curing at original fabric dimensions on a pin frame in ovens with circulating hot air. Drying was accomplished

Fig. 1. Diagrams of weaves used. Warp yarns are crosshatched.



in 7 minutes at 60 C and curing in 4 minutes at 160 C.

After curing, the fabric samples were given a process wash with 0.03% nonionic detergent in an automatic home washer at 100 F, using the "modern fabrics" cycle. The samples were then drip-dried and allowed to air-equilibrate.

Add-on of resin finish was approximated by direct weighing of the air-equilibrated samples and judged more accurately by Kjeldahl determination of nitrogen content. Physical testing was performed on three specimens of each combination of fabric and treatment by the standard methods of ASTM with tearing strength determined by the Elmendorf method (literature reference 1-a) and crease recovery angles with the Monsanto tester (lb). Breaking strengths were determined on strips ravelled to the thread count given for the various fabrics in *Table 1* (1-c).

TABLE 1. Geometric Parameters Varied in Experimental Fabrics

Fabric	Wt	Threads/Inch		Yarn Number		Twist Multiplier		
Number	oz/sq yd	Warp	Fill	Warp	Fill	Warp	Fill	Weave
1	2.83	64	64	30/1	30/1	4.0Z	4.0Z	Plain
2	2.40	—	48	—	—	—	—	—
3	3.14	—	48	—	18/1	—	—	—
4	3.18	—	80	—	—	—	—	—
5	2.67	—	80	—	42/1	—	—	—
6	2.87	—	—	—	—	—	4.0S	—
7	2.82	—	—	—	—	—	3.0Z	—
8	2.78	—	—	—	—	—	3.5Z	—
9	2.83	—	—	—	—	—	4.5Z	—
10	2.87	—	—	—	—	—	5.0Z	—
11	2.78	—	—	—	—	—	—	2/1 Twill
12	2.77	—	—	—	—	—	—	2/2 Twill
13	2.76	—	—	—	—	—	—	3/1 Twill
14	2.79	—	—	—	—	—	—	2x2 Basket
15	2.81	—	—	—	—	—	—	Oxford
16	5.04	—	—	18/1	18/1	—	—	—
17	3.80	—	—	18/1	—	—	—	—
18	4.75	—	—	18/1	18/1	—	—	3/1 Twill
19	4.98	—	—	18/1	18/1	—	—	Oxford
20	1.97	—	—	42/1	42/1	—	—	—
21	2.48	—	—	42/1	—	—	—	—
22	1.90	—	—	42/1	42/1	—	—	3/1 Twill
23	2.02	—	—	42/1	42/1	—	—	Oxford

NOTE: Dash indicates parameter is the same as that of fabric 1.

RESULTS AND DISCUSSION

The weight add-on of finishing agent was approximately 6% for all fabric samples after treatment. Samples processed with DMEU alone contained 1.4-1.5% nitrogen and samples processed with the formulated treating solution contained 1.1-1.2% nitrogen. The slight differences in add-on and nitrogen content which did occur among similarly treated fabric samples were due to variations in wet pickup during padding and are not considered of sufficient magnitude to invalidate the comparisons made. Although the weight add-ons are within a practical range, they are slightly higher than the amounts generally used in commercial practice.

The data on crease recovery angles and tearing strengths for triplicate determinations of these three series of fabrics, plus a fourth variation not reported herein, were subjected to analysis of variance (4, 8). The 5% significance level was used as the criterion for establishing differences.

To simplify the analysis of results, the comparisons enabled by the fabrics and exclusive of chemical treatments are brought out by the arrangements of treatment results into sub-sets by fabric characteristics as shown in the accompanying tables.

In the statistical analysis of the small sub-sets interaction with fabric direction (warp or filling) existed almost everywhere. This means that the warp and filling do not always respond in the same manner to variations in geometry and to different chemical treatments of the fabrics. The logical result of this is that geometry and treatment effects should be studied on each of the fabric directions rather than on the average or sum of both directions.

Crease Recovery Angle. The distribution of crease recovery angles, warp and filling, for the untreated fabrics and the two chemically treated sets of fabrics is displayed in *Figure 2.* This figure indicates that treatment with

Fig. 2. Distribution of crease recovery angles, warp and filling.

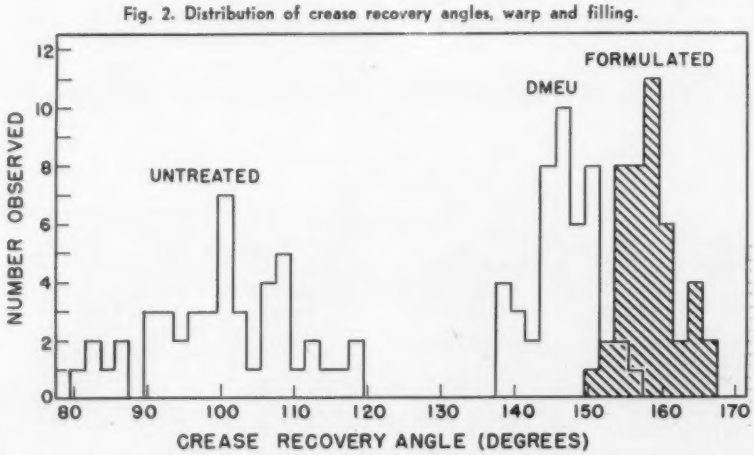


TABLE 2. Effect of Variation in Filling Thread Count and Yarn Number on Fabric[1] Crease Recovery Angle, Tearing Strength, and Breaking Strength

Threads/In. Filling	Treatment[2]	Yarn Number, Filling 18/1	30/1	42/1
		Crease Recovery Angle (Deg, W&F)		
		(3)	(2)	
48	O	106 & 100	100 & 103	
	A	149 & 144	144 & 153	
	B	164 & 152	160 & 159	
			(1)	
64	O		106 & 98	
	A		147 & 147	
	B		157 & 164	
			(4)	(5)
80	O		109 & 100	92 & 99
	A		150 & 139	144 & 150
	B		165 & 155	155 & 157
		Tearing Strength (Grams, W&F)		
		(3)	(2)	
48	O	946 & 1337	1109 & 897	
	A	386 & 450	410 & 282	
	B	550 & 665	611 & 417	
			(1)	
64	O		1047 & 918	
	A		430 & 302	
	B		537 & 316	
			(4)	(5)
80	O		962 & 1062	891 & 681
	A		386 & 313	410 & 200
	B		557 & 436	553 & 380
		Breaking Strength (Lb, W&F)		
		(3)	(2)	
48	O	43.6 & 51.8	43.8 & 28.7	
	A	22.8 & 28.6	25.6 & 17.1	
	B	23.7 & 27.1	23.0 & 16.4	
			(1)	
64	O		42.8 & 40.0	
	A		26.6 & 23.1	
	B		25.9 & 22.0	
			(4)	(5)
80	O		39.7 & 54.7	43.7 & 39.0
	A		25.7 & 32.4	27.0 & 21.3
	B		23.0 & 32.2	25.7 & 22.5

[1]Numbers in parentheses refer to fabric number in Table 1. Structural parameters other than those noted are the same as fabric 1.

[2]O—Untreated; A—DMEU; B—Formulated.

DMEU increases the crease recovery angles and that the formulated treatment increases the angles still further. This figure also indicates that, though untreated fabrics may have a sizable spread in crease recovery angle, treatment with either of the formulations tends to narrow this spread, bringing each fabric fairly close to the crease recovery angle which is typical of that particular treatment.

The mean squares estimating interaction of chemical treatment by fabric direction with the many fabrics were significantly larger than the error in determinations, but seemed to be quite stable among the several sub-sets of fabrics, hence they were accepted as estimating the experimental error of such determinations. The mean value of these mean squares, 50.6 with 69 degrees of freedom, is taken as the error mean square affecting crease recovery angles of all the experimental fabrics. To compare means and to determine least significant differences (LSD) the following formulas are used:

$$LSD = \frac{(\text{Students' } t)\ \sqrt{(2)\ (\text{Error mean sq.})}}{\sqrt{\text{Number of specimens in each avg.}}}$$

$$= \frac{(2.00)\ \sqrt{(2)\ (50.6)}}{\sqrt{\text{Number of specimens in each avg.}}}$$

$$= \frac{20.12}{\sqrt{\text{Number of specimens in each avg.}}}$$

For comparing the means of 3 triplicates of a single fabric under a particular chemical treatment and taken in a single direction of the fabric, the LSD is calculated to be:

$$LSD = 20.12/\sqrt{3} = 12^{\circ}$$

The use of this test of significance is permissible in comparing those means in which there is some basic reason for the comparison but not those which might be interesting to compare merely because the results indicate wide differences.

The crease recovery angles of samples of the various fabrics are presented in *Tables 2* through *6*.

Table 2 contains data on fabrics in which the warp remained constant but yarn number and threads per inch were varied in the filling direction. Using the criterion of the LSD it is apparent that in all cases there was significant increase in the crease angle from treating with DMEU. There were further increases from the formulated treatment in the warp of three fabrics and the filling of two fabrics.

These data also demonstrate the interaction of fabric direction and construction variables. Comparing fabrics 4 and 5, which differ only in filling yarn number, it is seen that crease recovery angle was greater in the warp than in the filling for fabric 4 but the reverse of this in fabric 5. Interaction between fabrics and fabric direction can also be observed in *Table 3*, where the results with untreated

TABLE 3. Effect of Variation in Warp and Filling Yarn Number on Fabric[1] Crease Recovery Angle, Tearing Strength, and Breaking Strength

Yarn No. Warp	Treatment[2]	Yarn Number, Filling 18/1	30/1	42/1
		Crease Recovery Angle (Deg, W&F)		
		(16)	(17)	
18/1	O	93 & 104	83 & 104	
	A	140 & 141	139 & 149	
	B	158 & 157	157 & 163	
			(1)	
30/1	O		106 & 98	
	A		147 & 147	
	B		157 & 164	
			(21)	(20)
42/1	O		102 & 93	109 & 97
	A		151 & 147	152 & 144
	B		162 & 155	157 & 157
		Tearing Strength (Grams, W&F)		
		(16)	(17)	
18/1	O	1535 & 1524	1480 & 1030	
	A	575 & 513	—[3] & 275	
	B	741 & 708	863 & 417	
			(1)	
30/1	O		1047 & 918	
	A		430 & 302	
	B		537 & 316	
			(21)	(20)
42/1	O		621 & 883	838 & 977
	A		316 & 328	333 & 206
	B		457 & 520	501 & 360
		Breaking Strength (Lb, W&F)		
		(16)	(17)	
18/1	O	57.5 & 62.9	75.2 & 42.4	
	A	40.3 & 50.2	44.5 & 27.0	
	B	43.2 & 55.7	48.6 & 30.1	
			(1)	
30/1	O		42.8 & 40.0	
	A		26.6 & 23.1	
	B		25.9 & 22.0	
			(21)	(20)
42/1	O		32.2 & 39.3	29.8 & 26.3
	A		19.0 & 24.0	17.3 & 16.4
	B		23.6 & 19.7	15.9 & 16.9

[1]Numbers in parentheses refer to fabric number in Table 1. Structural parameters other than those noted are the same as fabric 1.

[2]O—Untreated; A—DMEU; B—Formulated.

[3]Fabric tore across filling direction.

samples of fabrics 17 and 1 show an increase in warp recovery angle but a decrease in filling recovery angle as warp yarn number is increased. DMEU treatment increased the recovery angle both warp and filling for every fabric and the formulated treatment increased the recovery angle over the DMEU treatment of two fabrics in the warp direction and of four fabrics in the filling direction.

In *Table 4* are shown the results of varying weave, yarn number, and fabric treatment. Treatment with DMEU gave improved crease recovery for every fabric, both warp and filling. In fabrics from 18/1 yarns the formulated treatment produced fabrics with even higher crease recovery, both warp and filling in all cases, whereas in the fabrics from 30/1 yarns there were increases for all three fabrics in the filling but only one in the warp, and in the 42/1 yarn fabrics there was only a single increase in the filling direction and none in the warp.

The data indicate that the formulated treatment is more effective in increasing the crease recovery of fabrics from coarser yarns than of fabrics from finer yarns. None of the three fabric weaves, plain, oxford, or 3/1 twill, seems to give a more wrinkle-resistant product that the other two. Similarly, no effects attributable to weave variation can be seen in the data for the treated fabrics of *Table 5*.

Effects of variation in filling twist multiplier (TM) and direction of twist on crease angle are shown by the data in *Table 6*. These data indicate that, with untreated fabrics, crease angle rises to a maximum, both warp and filling, at a filling TM of about 4.0. Treatment with DMEU created significant increases in crease recovery on every fabric, both warp and filling. The formulated treatment caused some further increases, significant in the filling direction of five fabrics and in the warp for three fabrics.

It might seem that the improvement in crease recovery angles of fabrics with filling TM near 4.0 were improved less than for fabrics of either lower or higher filling TM. This was because there was originally more room for improvement of those fabrics with extremes in filling TM. There were no differences in crease recovery angles between treated samples of fabric 6 in which the filling twist direction was reversed (S twist) and samples of a similar fabric with Z twist (fabric 1).

Tearing Strength. Preliminary analysis of tearing strength data indicated that the variance of Elmendorf tearing strength determinations increased with the mean strength value. As a result of this finding the strength values were

transformed to logarithms (base 10) of the strength for purposes of statistical analysis (2). As a consequence, any difference in the log tearing strength of two fabrics, or treatments, implies a proportionate difference between the actual strength of the two, the constant of the proportionality being the antilog of the difference.

The mean squares estimating interaction of chemical treatment by fabric direction with the many fabrics were significantly larger than the errors in determinations, but seemed to be quite stable among the several subsets of fabrics, hence they were accepted as estimating the experimental error of such determinations. The mean value of the mean squares, 0.00454 with 68 degrees of freedom, is taken as the error mean square affecting tearing strength of all the experimental fabrics.

To compare means and to determine least significant differences the following formulas are used:

$$LSD = \frac{(2.00)\sqrt{(2)\ (0.00454)}}{\sqrt{\text{Number of specimens in each avg.}}}$$

$$= \frac{0.1905}{\sqrt{\text{Number of specimens in each avg.}}}$$

For means of triplicate determinations of a single fabric, for a single treatment and direction, the LSD is:

$$LSD = 0.1905/\sqrt{3} = 0.110$$

The constant of proportionality for the comparisons is the antilog of 0.110 = 1.28 which means that one fabric must be about 1.3 times as strong as another, or 30% stronger, to be regarded as truly different.

The tearing strength data of samples of the various fabrics are presented in *Tables 2* through *6* as the antilogs of the average logarithmic values. From the data it is apparent that DMEU significantly decreased the strength of every fabric, warp and filling. The formulated treatment likewise significantly decreased the strength of every fabric except in the warp direction of an oxford weave of 42/1 yarns (*Table 4*, fabric 23) but not so much as DMEU since the same fabrics were significantly stronger when treated with the formulation than when treated with DMEU. This is true for every fabric except fabric 1, which gave apparently anomalous results when considered in conjunction with the behavior of similar fabrics.

The effects of variation in filling thread count and yarn number on tearing strength are shown in *Table 2*. At constant filling yarn number (30/1) increasing filling thread count apparently caused an increase in filling tearing strength but a decrease in warp tearing strength. This reversal was large enough to be significant when fabric averages are considered. Decrease in filling yarn number caused significant increases in filling tearing strength, except in the

TABLE 4. Effect of Weave on the Crease Recovery Angle, Tearing Strength, and Breaking Strength of Fabrics[1] With Yarns of Various Numbers

Yarn Number W&F	Treatment[2]	Weave: Plain	Weave: 3/1 Twill	Weave: Oxford
Crease Recovery Angle (Deg, W&F)				
		(16)	(18)	(19)
18/1	O	93 & 104	107 & 117	109 & 100
	A	140 & 141	145 & 154	147 & 146
	B	158 & 157	160 & 167	161 & 159
		(1)	(13)	(15)
30/1	O	106 & 98	109 & 90	119 & 111
	A	147 & 147	151 & 148	149 & 144
	B	157 & 164	165 & 163	157 & 158
		(20)	(22)	(23)
42/1	O	109 & 97	101 & 95	113 & 112
	A	152 & 144	150 & 155	151 & 146
	B	157 & 157	154 & 159	154 & 150
Tearing Strength (Grams, W&F)				
		(16)	(18)	(19)
18/1	O	1535 & 1524	2218 & 2456	2606 & 2399
	A	576 & 512	692 & 593	1014 & 576
	B	741 & 708	1104 & 940	1710 & 912
		(1)	(13)	(15)
30/1	O	1047 & 918	1560 & 1633	1919 & 1762
	A	430 & 302	575 & 368	813 & 404
	B	537 & 316	871 & 746	1306 & 753
		(20)	(22)	(23)
42/1	O	838 & 977	1432 & 1750	1570 & 1607
	A	333 & 206	617 & 341	697 & 333
	B	501 & 360	832 & 621	1500 & 661
Breaking Strength (Lb, W&F)				
		(16)	(18)	(19)
18/1	O	57.5 & 62.9	55.5 & 56.1	55.3 & 55.7
	A	40.3 & 50.2	44.3 & 45.0	45.7 & 42.4
	B	43.2 & 55.7	42.1 & 45.3	49.3 & 44.1
		(1)	(13)	(15)
30/1	O	42.8 & 40.0	40.5 & 37.1	41.1 & 41.0
	A	26.6 & 23.1	24.8 & 19.4	26.3 & 22.0
	B	25.9 & 22.0	23.2 & 19.1	24.3 & 21.2
		(20)	(22)	(23)
42/1	O	29.8 & 26.3	28.1 & 26.6	27.9 & 25.5
	A	17.3 & 16.4	17.2 & 12.9	16.5 & 12.5
	B	16.9 & 15.9	16.5 & 12.7	16.9 & 13.6

[1]Numbers in parentheses refer to fabric number in Table 1. Structural parameters other than those noted are the same as fabric 1.

[2]O—Untreated; A—DMEU; B—Formulated.

TABLE 5. Effect of Weave on Fabric[1] Crease Recovery Angle, Tearing Strength, and Breaking Strength

Weave	Treatment[2]	Crease Recovery Angle (Deg, W&F)	Tearing Strength (Grams, W&F)	Breaking Strength (Lb, W&F)
		(1)	(1)	(1)
Plain	O	106 & 98	1047 & 918	42.8 & 40.0
	A	147 & 147	430 & 302	26.6 & 23.1
	B	157 & 164	537 & 316	25.9 & 22.0
		(11)	(11)	(11)
2/1 Twill	O	94 & 99	1164 & 1349	39.7 & 35.3
	A	148 & 144	463 & 321	26.7 & 21.8
	B	158 & 158	746 & 557	24.6 & 21.6
		(12)	(12)	(12)
2/2 Twill	O	101 & 107	1778 & 1845	39.9 & 36.0
	A	150 & 141	611 & 398	25.7 & 19.5
	B	159 & 159	946 & 746	23.0 & 19.3
		(13)	(13)	(13)
3/1 Twill	O	109 & 90	1560 & 1633	40.5 & 37.1
	A	151 & 148	575 & 368	24.8 & 19.4
	B	165 & 163	871 & 746	23.2 & 19.1
		(14)	(14)	(14)
2x2 Basket	O	109 & 118	2630 & 3981	40.9 & 28.4
	A	146 & 144	1054 & 611	24.5 & 20.0
	B	157 & 155	2099 & 1479	25.9 & 18.3
		(15)	(15)	(15)
Oxford	O	119 & 111	1919 & 1762	41.1 & 41.0
	A	149 & 144	813 & 404	26.3 & 22.2
	B	157 & 158	1306 & 753	24.3 & 21.2

[1]Numbers in parentheses refer to fabric number in Table 1. Structural parameters other than those noted are the same as fabric 1.

[2]O—Untreated; A—DMEU; B—Formulated.

case of fabrics with 80 threads per inch with the formulated solution.

Table 3 gives data for fabrics in which both the warp and filling yarn number were varied. At constant filling yarn number (30/1) increasing warp yarn number resulted in decreased tearing strength in the warp direction, but not the filling direction, of both untreated and treated fabric. At constant warp yarn number increasing filling yarn number resulted in decreased tearing strength in the filling direction, but not the warp direction, of both untreated and treated fabric. Such differential effects of direction were not observed when warp and filling yarn numbers were increased simultaneously by similar amounts—compare fabrics 16, 1, and 20. In this case strength decreased approximately equally in both directions and for both treated and untreated fabrics.

As shown by the data in *Tables 4* and *5*, variations in weave have extremely pronounced effects on tearing strength properties of fabrics. These data show that every variation from a plain weave produced fabric with significantly better tearing strengths. This was true for every untreated fabric except for the warp of fabric 11, a 2/1 twill, and true in every case for fabric given the formulated treatment.

The data of *Table 4* also show that twill and oxford weave samples receiving the formulated treatment had tearing strengths equal to or greater than those of plain weave fabric constructed of coarser yarns.

The improvement in tearing strength due to using the formulation rather than DMEU was significantly higher in the twill and oxford weaves than it was in the plain weave fabrics. All oxford weave fabrics had higher warp tearing strength retention after the formulated treatment than plain and twill weave fabrics.

Table 5 duplicates some of the data in *Table 4;* however, it contains data on some additional weave variations. These data show that samples of the 2 x 2 basket weave which received the formulated treatment were stronger than any other treated fabric, that 2/2 twill samples were as strong as 3/1 twill samples and stronger than 2/1 twill samples which were in turn stronger than treated plain weave samples. The oxford samples were the same as 2/2 and 3/1 twill in the filling direction but stronger than these in the warp direction.

The tearing strengths as affected by variations in TM are shown in *Table 6*. In this set the TM of the filling yarns only was varied. Changing filling twist direction had no effect on tearing strength (fabrics 6 and 1). As expected, the filling tearing strengths of the untreated fabrics were higher at the intermediate TM values than at either of the extremes. The same relationship was observed in the warp tearing strengths. After treatment, there were no signifi-

TABLE 6. Effect of Variation in Filling Twist Multiplier on Fabric[1] Crease Recovery Angle, Tearing Strength, and Breaking Strength

Filling TM	Treatment[2]	Crease Recovery Angle (Deg, W&F)		Tearing Strength (Grams, W&F)		Breaking Strength (Lbs, W&F)	
		Direction of Filling Twist		Direction of Filling Twist		Direction of Filling Twist	
		Z	S	Z	S	Z	S
		(7)		(7)		(7)	
3.0	O	81 & 87		813 & 759		46.1 & 42.1	
	A	143 & 147		437 & 275		27.9 & 22.6	
	B	159 & 161		607 & 410		23.8 & 21.3	
		(8)		(8)		(8)	
3.5	O	90 & 96		897 & 968		44.2 & 41.3	
	A	147 & 147		423 & 270		27.7 & 23.8	
	B	164 & 160		575 & 410		25.8 & 20.6	
		(1)	(6)	(1)	(6)	(1)	(6)
4.0	O	106 & 98	83 & 100	1047 & 918	891 & 769	42.8 & 40.0	42.6 & 43.0
	A	147 & 147	138 & 157	430 & 302	398 & 263	26.6 & 23.1	27.1 & 26.0
	B	157 & 164	153 & 167	537 & 316	557 & 404	25.9 & 22.0	25.5 & 21.9
		(9)		(9)		(9)	
4.5	O	97 & 92		984 & 1023		45.1 & 43.0	
	A	149 & 142		392 & 288		26.2 & 25.9	
	B	160 & 155		562 & 485		23.7 & 25.1	
		(10)		(10)		(10)	
5.0	O	91 & 84		883 & 843		44.2 & 39.6	
	A	151 & 139		374 & 309		25.9 & 26.6	
	B	158 & 154		528 & 457		25.9 & 25.6	

[1]Numbers in parentheses refer to fabric number in Table 1. Structural parameters other than those noted are the same as fabric 1.
[2]O—Untreated; A—DMEU; B—Formulated.

cant differences between fabrics receiving the same treatment; however, the results indicate a trend toward higher strengths in the filling but lower strengths in the warp as TM is increased. This reversal was significant.

Since the results of the effect of yarn TM on tearing strength differed from the expected effects, the distribution of finishing agent between warp and filling yarns was determined by obtaining nitrogen analyses on warp and filling yarns removed from samples of the DMEU treated fabrics. These data are given in *Table 7*. There was a significant linear relationship between twist multiplier of filling yarns and nitrogen content of warp yarns, but no such relationship for the filling yarns themselves. This indicates that the amount of finishing agent in the filling yarns was practically constant whereas the amount in the warp yarns increased as the TM of the filling yarns increased.

It was thought that the filling yarns with low TM, being softer, would pick up more resin than the higher twist yarns and the content in the warp yarns would remain constant. The results show the opposite to be true. A possible explanation of these results is that the softer filling yarns are deformed more during padding which results in greater expression of solution from the warp yarns. Although these differences in distribution did not produce significant tearing strength differences, the data indicate that variation in construction parameters of fabric can produce variations in finishing agent distribution.

Breaking Strength. The effects of variation in fabric structure on breaking strengths of the original and treated fabrics are given in *Tables 2* through *6*. These data were not treated statistically.

The filling strength *(Table 2)* was increased by increased filling count but the per cent of strength retained after treatment was not affected.

TABLE 7. Effect of Variation in Filling Twist Multiplier on Finishing Agent Distribution in Warp and Filling Yarns

Fill TM	Fabric No.	Nitrogen, %	
		Warp	Fill
3.0	7	1.15	1.42
3.5	8	1.27	1.31
4.0	1	1.31	1.46
4.5	9	1.37	1.49
5.0	10	1.40	1.47

The data in *Table 4* show that a decrease in yarn number caused an increase in breaking strength and also in per cent of strength retained after treatment. This effect on per cent of strength retained is not shown by the data in *Tables 2* and *3*.

Variations in weave as seen from the data in *Table 4* had no significant effects on the breaking strengths or strength retention of the treated samples, however the

results in *Table 5* would seem to indicate that the 2 x 2 basket weave fabric had a lower initial filling strength than samples of other weaves. The strength of this fabric after treatment was equal or nearly equal to that of treated samples of other fabrics.

SUMMARY AND CONCLUSIONS

Physical properties of fabrics in one direction are not necessarily independent of structural variation in the other direction. Because of this interaction, it is necessary to study the directional properties individually rather than the average or sum of the warp and filling directions.

Variations in fabric structure were found to have definite directional influence on the crease recovery angles of fabrics with wrinkle resistant treatments. Although untreated fabrics of various structure were found to have a wide spread in crease recovery angle, a wrinkle resistance treatment tends to narrow this spread, bringing each fabric fairly close to the crease recovery angle which is typical of the treatment.

Tearing strengths of wrinkle-resistant fabrics can be improved by using fancy weaves rather than plain weaves. The oxford and 2 x 2 basket weaves produce fabrics with the best tearing strength properties of those tested. These results agree with a previous report (5) that any variation which will improve the yarn mobility will produce fabrics with greater tearing strengths.

Use of yarns of lower yarn number also improves tearing strength properties; however, it should be kept in mind that this improvement is accompanied by an increase in weight and changes in cover factor.

Variations in fabric structure do not have much effect on breaking strength, although it appears that in some fabrics coarse yarns retain more strength after resin treatment than fine yarns.

It has been shown that variations in TM have an effect on resin distribution between warp and filling yarns of wrinkle resistance treated fabrics.

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● *The final article of this series will appear in the October issue. —The Editors*

Progress report on spinning frame doffer shown in Georgia last year

■ DEVELOPMENT of the Spanish automatic doffer for spinning frames —the original prototype of which was first demonstrated in this country in the summer of 1958 at Riegel Textile Corp., Trion, Ga. (TI for Sept., 1959, p. 83)—is proceeding satisfactorily, according to Norman Wonnacott, president of Willcox & Gibbs Sewing Machine Co., exclusive licensee to manufacture and sell it.

Known as the "Treufus" automatic doffing machine, it is both a method and device for the mechanical doffing of ring spinning frames, Mr. Wonnacott explained. Adaptable without modification to spinning frames of all gauges, it automatically doffs full bobbins and simultaneously replaces them with empty bobbins, he said.

While the ultimate efficiency of the doffer is yet to be determined, bobbins can be doffed and replaced at a rate in excess of 18,000 per hour, Mr. Wonnacott reported, explaining that from this figure there must be deducted the time required to engage and disengage the machine to and from the spinning frame, to unload doffed bobbins, and to replenish the supply of empty bobbins. After making liberal allowances for these factors, the effective doffing and replacement rate is estimated at 6,000 to 8,000 per hour, he said.

This automatic doffing machine was described as follows:

The apparatus is manually operated. There are no electric drives involved and consequently no wiring connections. The unit is extremely mobile; the floor wheels permit it to be easily moved from one side of the spinning frame to the other and from spinning frame to spinning frame. The undercarriage is provided with hydraulic means by which the unit can be readily raised and lowered. This facilitates easy engagement and separation of the doffer at the spinning frame. Extensive use is made of ball bearings to insure smooth and uniform movement of the unit along the guide rails which are attached to the spinning frame on both sides.

The doffing operation is accomplished by a series of bridge-like members which form an inclined plane. The base of each bridge member is equipped with an open plow-like element. The first bridge engages the base of the bobbin and by virtue of the forward motion of the machine breaks the contact of the bobbin with the spindle and partly raises the bobbin on the spindle. The succeeding bridge members as they pass each spindle and its related bobbin, because they form an inclined plane, raise the bobbin vertically on the spindle until it is completely separated and slides down a chute to a receiving box in the unit. The process of doffing and bobbin replacement continues as long as the "Treufus" is in motion.

A guide is located in advance of the first bridge member which makes contact with the yarn and as a consequence moves both yarn and traveler to the back of the ring.

Empty bobbins are loaded in a drum and are fed automatically to a point of discharge from which they are released by a sensing device which triggers a releasing mechanism. The releasing mechanism is synchronized by the sensing device which bears against the spindle, thus timing the accurate placement of the empty bobbins on the spindles. A spring loaded hammer makes contact with the top of the replacement bobbin coincidentally with its release by the triggering mechanism.

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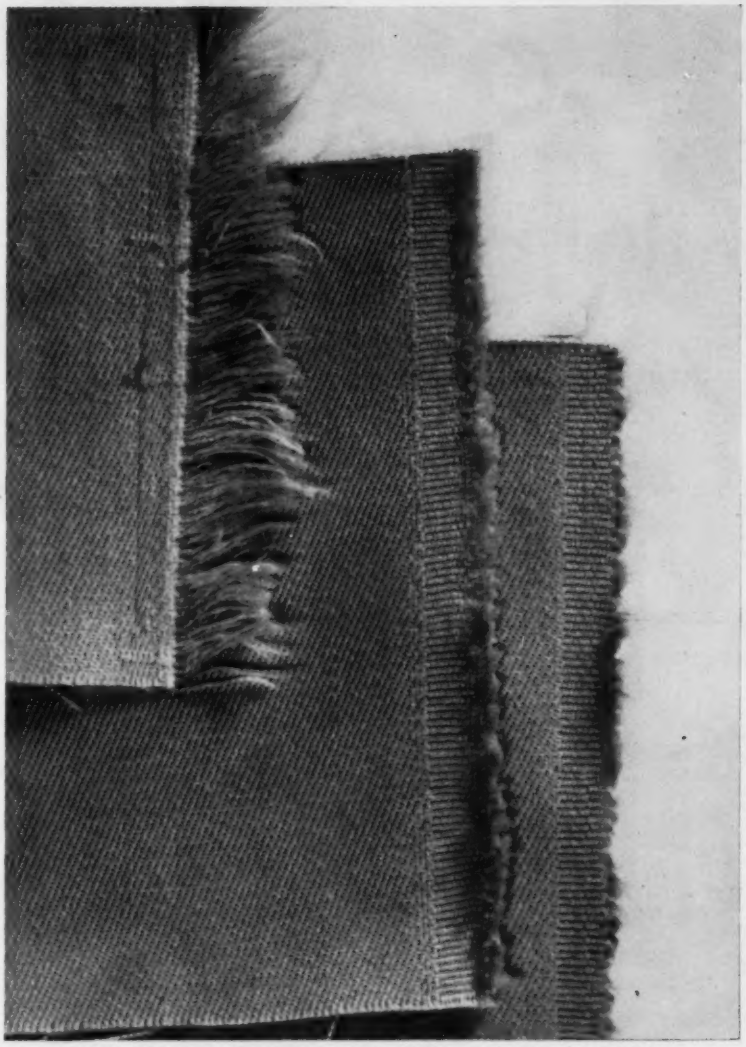


A study in fringe selvages. The one to the right gave best results in finishing.

■ *THE SELVAGES associated with the shuttleless loom have caused some concern among mill men who wonder if such fringe selvages are troublesome in finishing, if garment cutters will accept them, etc. To be specific, we list some of the leading questions we have received and which we set out to answer—but we restricted our research to fabrics containing one "fringe" selvage and one conventional, "hard" one.*

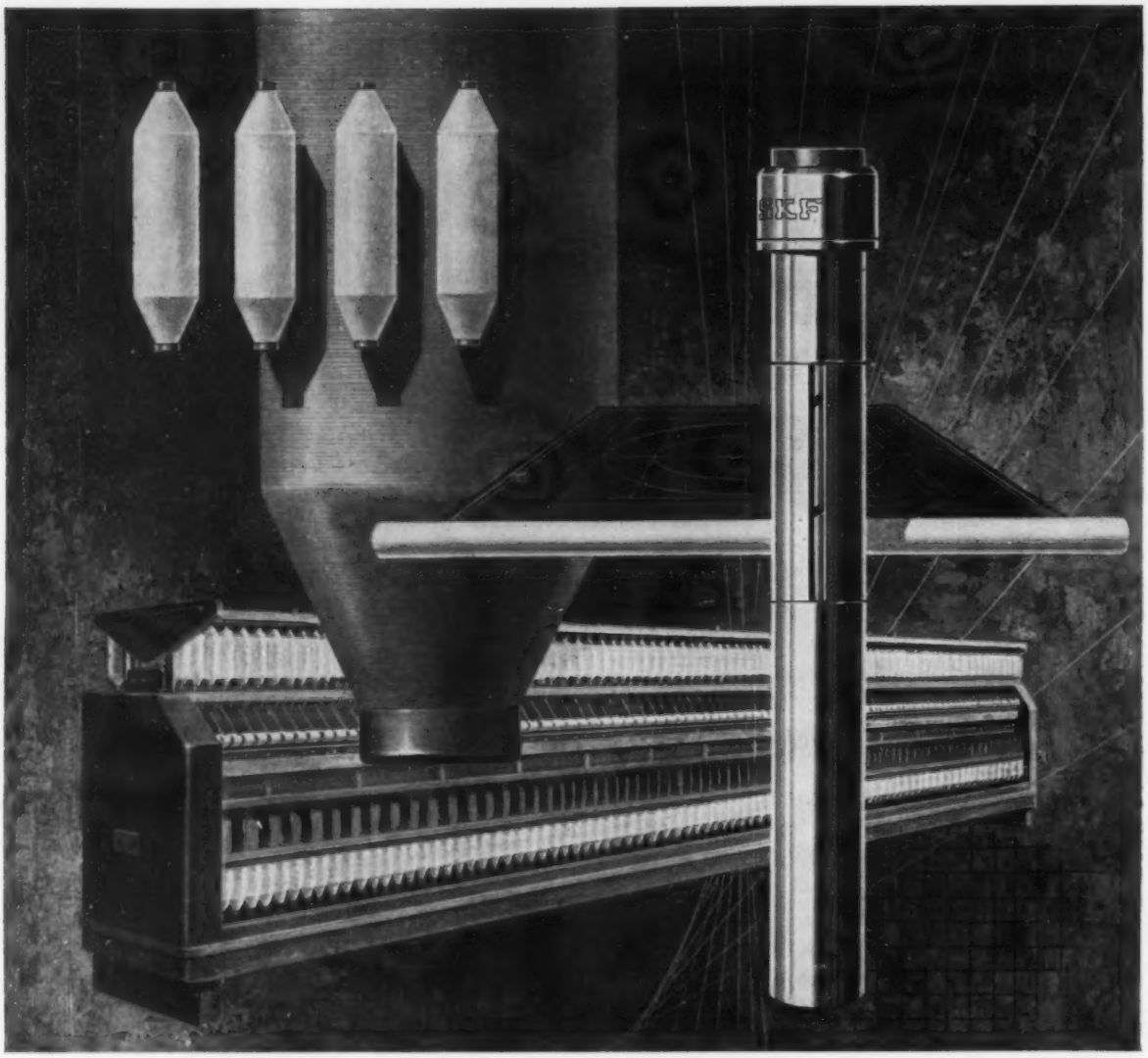
The topics examined included: 1. Weaving difficulties; 2. Finishing problems—linting, loose and tight selvages, fabric stresses, selvage failure, cost of finishing and dyeing a selvage fringe only to sell (?) it as waste, plus any other factors that might come to light during the investigation; 3. Cutting limitations.

The last category, one the average mill man doesn't normally study, perhaps was the least understood of all, for we often heard voiced the attitude that a fringe selvage could not be used by the garment cutters.

With these topics in mind, we conducted a modest survey, abandoning it only after we ran into the same answers repeatedly. Here are the results.—The Editors.

FUNDAMENTALLY, there is only one problem concerning the weaver—getting the cloth off the loom in the most efficient manner possible and in the best possible condition. The fringe selvage hardly enters his thoughts as anything other than a routine weaving matter—it certainly does not hamper him.

To solve the take-up and roll-up problem, he duplicates the "hard" or conventional selvage in the fringe-selvage side, draws in the outside leno ends that lock around the filling ends, and dismisses the



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"problem." He has, of course, to adjust each loom to produce an even fringe to prevent the doubled picks from being inserted off-center. The short end of such filling can produce broken picks near the selvage while the long end makes a mess of the fringe.

Finishing Techniques. If the weaver follows the script, the finisher anticipates no trouble. With a selvage constructed as outlined above, the fringe needs only to be sheared away to give the finisher an open road.

Cutting away the loose selvage answers many of the questions on linting, blotting up good chemicals, etc. It also prevents fouling tenter clips.

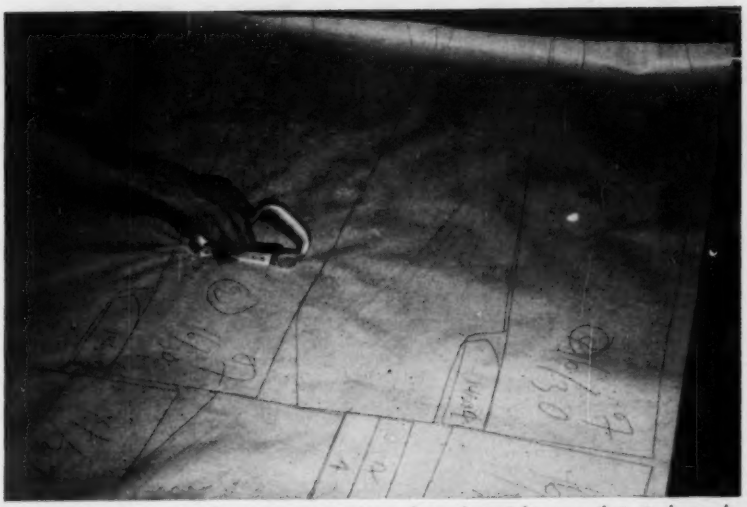
But it should be emphasized that the fringe must be sheared as closely as can be done without cutting the leno ends. That accident can cause the finisher considerable grief, as it lets the selvage ends burst from the filling ends.

The cloth stands up under range finishing without one selvage stretching more than the other and seems to have fewer locked-in stresses than do many conventional fabrics.

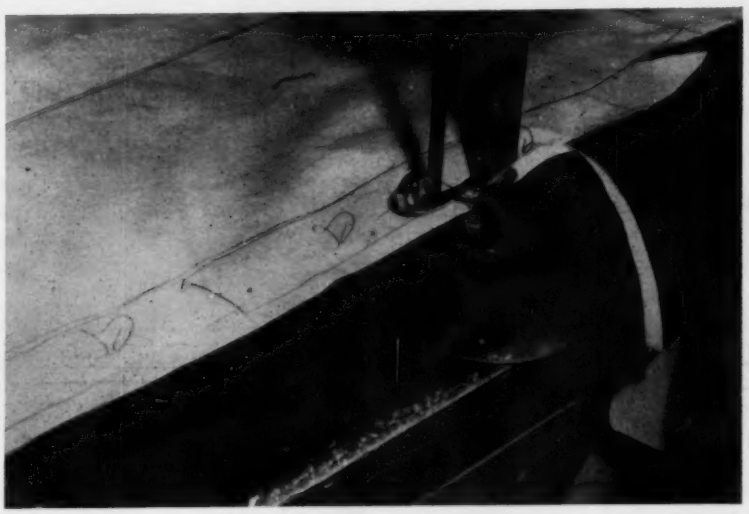
Cutting Problems. Some garment styles require perfect "hard" selvages, because the selvage is exposed in the finished product. Some cutters demand conventional selvages to save the seaming operation necessary to prevent fraying when a portion of the edge is left exposed inside the garment.

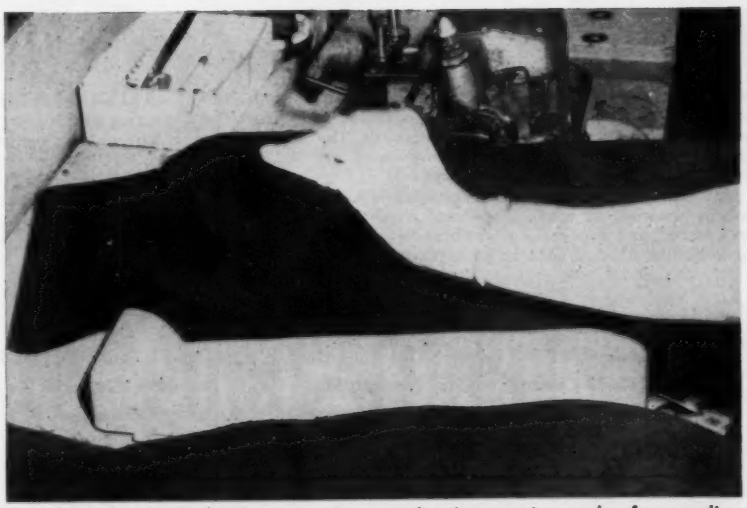
But one thing the cutters demand in common is admirably met in the cloth with the fringe selvage—the property to lie flat without selvage build-up and to give a "flush lay" or one straight edge as the fabric is positioned on the cutting table.

Furthermore, some cutting operations cut the selvages away and serge or seam the raw edges. And since this operation is in a field consuming a staggering amount of cloth per year, it presents a ready-made outlet for fringe-selvage fabrics for some time to come. By way of a check, turn a pair of your favorite slacks inside out and examine the seams for conventional selvages.



Whether they use the selvages or not, cutters demand straight ones that stack evenly. Above, the patterns are traced onto paper that is stapled to the stack of cloth; in the scene below, the cutter outlines a small garment part while staying well inside selvage.





The cut edges are serged, given a seaming operation, to prevent raw edge from raveling.

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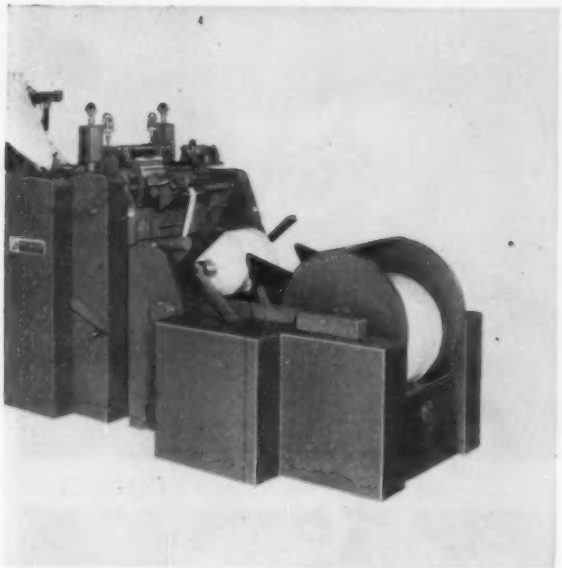
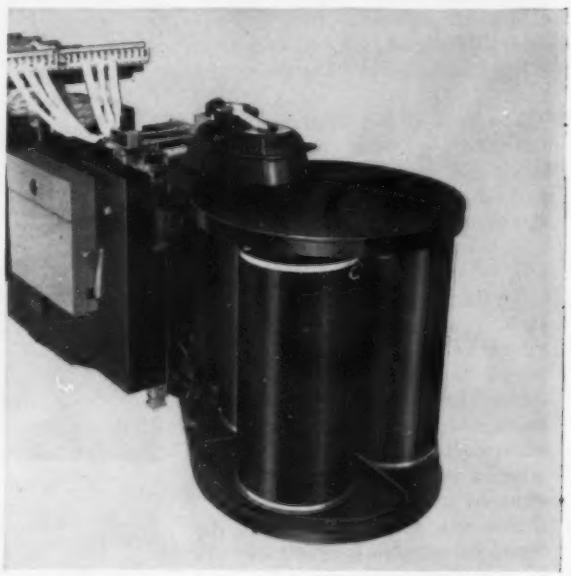


AUTOMATIC BALL DOFFER—Winds, doffs, and resumes winding a new ball without operator assistance. The entire doffing cycle takes less than 12 seconds. The unit delivers up to 12 oz./5 yds. on a ball with a maximum size of 18" x 24" that may weigh as much as 50 pounds.

The ball doffer is designed to provide fast, efficient production in a variety of applications, and is particularly suited for pre-combed and top making applications. It could also be set up to deliver finished balls to an in-plant transfer system.



AUTOMATIC CAN DOFFER—Completely automates the delivery on the single head intersecting draw frame. The unit accommodates three cans 18" or 20" in diameter, up to 42" high while doffing is accomplished "on the fly". It will handle up to 12 oz./5 yds., and fits into any production line where pin controlled drawing is used.

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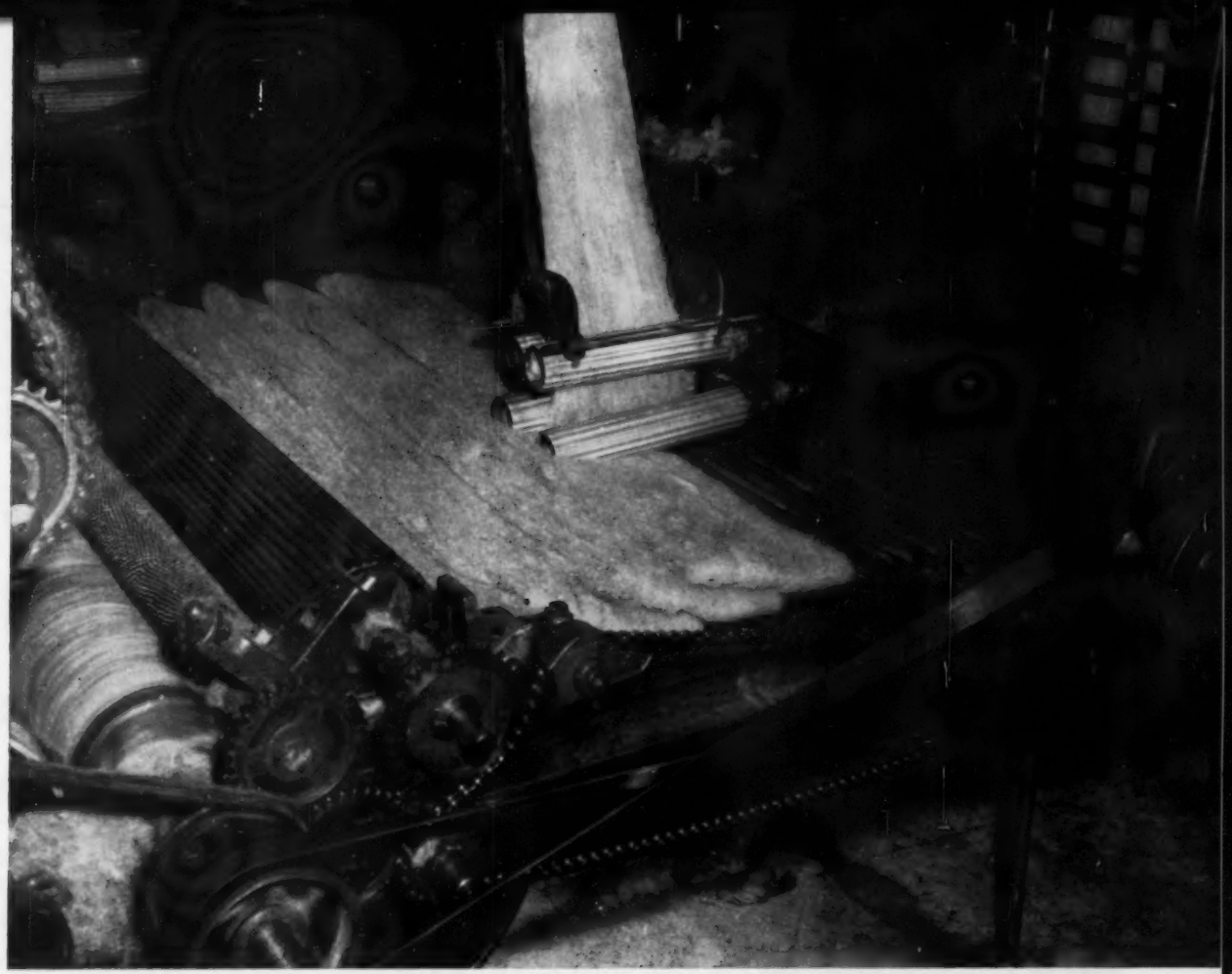


As most stock spreads out, much waste can be saved at the cross feed by keeping the feed two inches narrower than the cylinder.

Don't waste good fiber!

Ways to minimize shrinkage at the woolen card

by William J. Crofts
Consultant on woolen carding

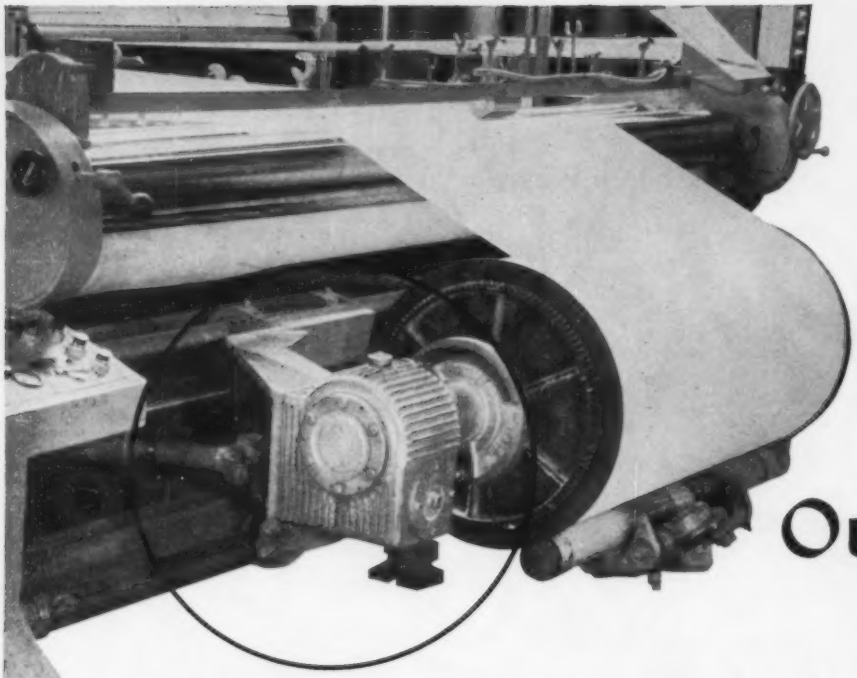
Exclusive

SHRINKAGE, or the weight lost between weighing-in and the finished fabric, is a matter of great concern to all mill managers, for it is inevitable that part of that weight loss represents clean fibers that otherwise would be made into finished products. It is with this clean fiber loss that this article is chiefly concerned, and, since most of the loss takes place at the card, the discussion is centered around controlling the loss at that process.

The amount of clean fiber present in the card waste is determined by weighing the waste, subjecting it to a vigorous dusting, and weighing it again. The difference in weights approximates the weight of clean fiber after the unwanted vegetable matter, sand, etc., are shaken out. Some allowance must be made for the oily emulsion added to the blends after the stock is weighed.

Each ounce of shrinkage is important: If the average cost of blends at the picker is $1.50 per pound with a six-per-cent fiber loss from carding, and this loss is reduced 20 per cent (to 4.8 per cent) the cost of the blend is reduced $1.50 x 0.012 or $0.018 per pound. After deducting an arbitrary 50 cents per pound as the market value of the waste, then at an annual production of one million pounds this reduction in card waste adds up to a savings of $18,000 per year.

About 15 years ago I took charge of a 14-set room in a mill making high-grade virgin wool fabrics. The card room had been ineptly handled for several years



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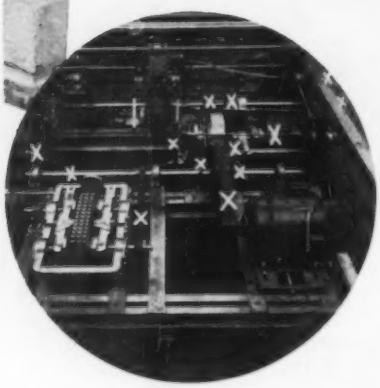

X These parts are eliminated

In this slasher drive a few simple and rugged parts replace the complicated maze of belts, chains, sprockets, etc. presently used in other slasher head drives. It has no sliding sprockets or gears. This eliminates the constant adjustments and the replacement of expensive parts which were formerly accepted as necessary. The result is long, trouble-free, and extremely quiet operation with greatly reduced downtime and consequent higher production.

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and the loss in clean fiber had gone up to 5.5 per cent. From the cylinders we stripped a thick blanket of clean fiber almost as good as virgin wool.

Replacing the fine-wire fancies with livelier wire stopped the cylinder loading, while a drastic reduction in the stripping operations made a further cut in stripping waste. Instead of stripping four or five cards every shift, stripping about five cards every three shifts reduced both waste and downtime.

As soon as we could obtain new clothing, we installed it on the cylinders and doffers that needed it most. As we overhauled and brought the cards to a high level of efficiency, we stepped production up—first by 10 per cent, then by another 10 per cent. This we proceeded to do, guided by spinning results, until we reached the highest production compatible with the stock. All these factors—new clothing, better fancies, less stripping, and top production—brought the loss in clean fiber from 5.5 per cent down to 3.2 per cent, this figure being the average over several weeks of "dusted" card waste.

We next checked the speeds of the 60-inch cylinder and found that their speeds of 65 to 68 rpm made reductions inadvisable. But a reading of tumbler speeds revealed that their speeds on 12 of the 14 sets were higher than necessary.

Why run a metallic breast at high speed when a lower speed accomplishes the same result and allows for slower tumbler speeds? A tumbler surface speed 30 to 35 per cent greater than surface speed of the roll it must clear of stock is usually sufficient. At the finisher, if speeds of leader and tumbler are both high, reducing speeds of both rolls will reduce the fiber lost by the tumbler.

We checked this point by slowing down the tumbler on one finisher card 41.6%, to 80 rpm, and left a neighboring card unchanged with its tumbler speed at 137 rpm. With both cards running on the same lot and with the floor swept clean under them, they were run for a few hours. The tumbler running at 137 rpm dropped far more waste.

"Good clothing is the leading factor in reducing shrinkage at the woolen card . . ."

Reducing the tumbler speeds effected a further small reduction in shrinkage until the final figure for clean fiber loss stood at 2.85 per cent, or approximately a 48-percent reduction from the original figure of 5.5 per cent. The average cost of the blends at that time being $1.45, and the annual production 1,500,000 pounds, when figuring that 39,750 pounds formerly "wasted" now went into yarns and fabrics, one finds an impressive saving of $57,637 per year. We obtained this result over a period of several months.

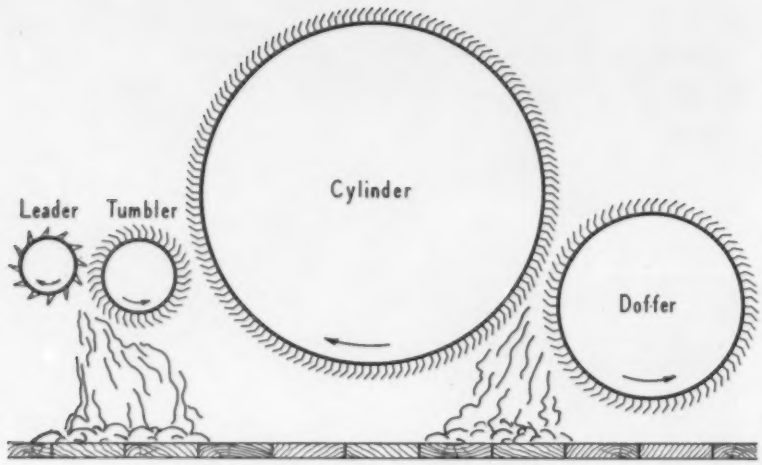
Clothing is All-Important. Good clothing is the leading factor in reducing shrinkage at the woolen card, and the fancy and doffer are the key rolls in waste saving, since the function of these two rolls is to unload the cylinder. There are not many positive statements that can safely be made regarding woolen carding when the many variables are considered, but here is one statement that is not controversial: *The doffer clothing must be as good or better than its cylinder.*

Working point against point, with the doffer playing the passive role of receiving the stock from the fast moving cylinder (after the fancy has raised the web), the two constantly vie for possession of the web. If the doffer is the weaker of the two, the cylinder carries a too-large portion of the web past the doffer—and a greater accumulation of clean fiber drops under the card in the form of card waste.

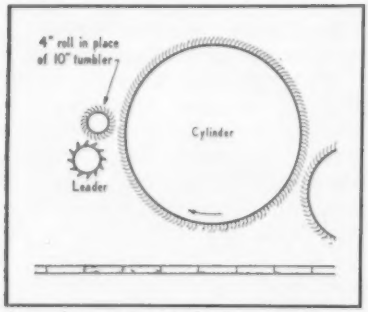
Under the most favorable conditions a measure of loose fiber clings to the cylinder surface after passing the doffer, so the cylinder clothing must be strong enough to carry this around for another contact with the doffer. Much depends on the fancy raising the web cleanly out of the cylinder wire.

There are two points on the card breaker where the bulk of the waste accumulates: one is directly under the contact point of the cylinder and doffer and the other is under the tumbler. Reducing tumbler speeds as much as possible, consistent with good clearance, will reduce fiber loss at this point. And using sharply pitched tumbler wire, which carries the web better than the regular standard pitch clothing, will help. Centrifugal force plays a large part in fiber loss, hence *lower tumbler speeds mean less lost fiber.*

Many cards have a single six-inch metallic roll in place of the conventional leader and tumbler at the finisher feed rolls. Since this roll strikes downward at the bite of the feed rolls, high speeds will cause more fiber drop. Like all metallic rolls, the teeth fill up with grease and if they are not cleaned regularly they will drop more and more fiber as the teeth become packed with grease. Long saw tooth points shaped like the teeth of a rip saw, are best as this type of tooth (like the high-



The two sources of the bulk of waste.



A woolen card with leader set close to the cylinder, the updraft from which stops nearly all the fiber-drop.

bent angular tumbler clothing) carries the stock much better and reduces fiber drop. With the same surface speed a small 6-inch roll will drop less good fiber than the 10-inch roll.

Speeds. At every revolution of the card cylinder, some fiber drops on the floor, the bulk of it collecting at a point directly under the "contact" point of cylinder and doffer. But the amount of waste thrown off at this point does not necessarily increase in proportion to a production increase. At high production, the card's percentage of waste is lowered over that of lower production rates. There is more to making top production than reducing labor and overhead costs, since there is also an appreciable reduction in clean fiber loss.

When making up a blend this factor should be considered. A slight improvement in quality might pay dividends in the form of waste saved as well as from a reduction in labor costs from increased production.

Table 1 reflects the results of a short waste study we made and which confirms our conviction that waste is not in proportion to card production.

Coarse wools, and other coarse animal fibers having far less tenacity than fine animal fibers, have a much greater tendency to spread and become air borne. Hence, with this type blend, cylinder speeds of about 60-62 rpm will reduce overhead flyings and fiber-drop under the card. For AA wool, and the fine synthetics with their great tenacity, cylinder speeds of 70 rpm are acceptable and desirable as the greater centrifugal force at the cylinder surface aids the fancy in its function of raising the web above the wire surface.

Doffer speeds also have a bearing on shrinkage. When making finer yarns from 3 to 5 run, speeds of 4½ to 5 rpm for a 36-inch doffer is fast enough. But with a much heavier web, as with heavy yarns, the points of the doffer wire load up much faster and at such slow speeds do not clear the cylinder. Hence, more fiber drop. Doffer speeds from 6½ to 7½ rpm will do a better job. Surface speed should be fast enough for the doffer to continuously present empty wire points to the cylinder.

Watch These Sources, Too. Allowing the first breaker table feed to enter the feed rolls spread out wider than the width of the card can cause considerable good stock to fall to the floor or to mess up both edges of the card with flyings. Nearly all stock has a tendency to spread sideways, so it is best to keep the feed at least two inches narrower than the width of the cylinder—allowing one inch empty space at each edge.

Adjustable wings at the point where the feed enters the feed rolls are provided for this purpose. At the broad band table feed, if the feed is laid out too wide with the slivers overlapping at each edge, the clean carded overlap is thrown on the floor at each side of the card.

Waste savers have been tried but discarded by many mills. The undergrids made to fit close up to and under the cylinder are dangerous wreck makers.

The long, slow-moving wood slat apron under the cylinders that carried all waste back to the tumblers was a good installation and one that could be used on both the finisher and first breaker without making lumpy roving. Unfortunately so much lint dropped through the cracks between slats to ball up inside the apron and cause frequent breakdowns that these had to be discarded. A tight apron such as the all metal apron with interlocking slats might be the answer to this problem.

Good card clothing is the best waste saver. Of all the factors bearing on the reduction of shrinkage at the woolen card good clothing heads the list in big capital letters. A general deterioration of the clothing will inevitably cause a rise in shrinkage.

Techniques in Waste Handling. For pulling the waste out from under the card an L-shaped piece of flat iron measuring about 6 inches each way, bolted to a long wooden handle will hook the waste out much quicker than a broom. The brush parts of brooms get torn up from contact with the frame of the card, so this tool will save a lot of brooms.

To protect the delicate card wire from being punched by the bare iron a rubber covering (such

as a piece of discarded bicycle tire or an inner tube) affords good protection and will stand wear and tear much longer than a leather sheath or covering. The rubber should project out beyond the tip of the iron hook and cover the iron completely.

At stripping time, cleaning out the waste is like killing two birds with one stone, since it saves on down time. All vacuum systems provide large outlets at floor level for receiving card waste. But the system is in use for stripping purposes so much of the time that there is little time left for other card waste transportation uses—the card waste and strippings must not be mixed.

Also, colors get mixed in passing through the pipes, and white or pastel shades become polluted with bits of colored waste and greasy dirt rendering them unfit for use in a subsequent lot of the same shade.

Many mills prefer to pack all card waste in box trucks of about 100 pounds capacity (preferably in a box made of smooth metal or fiber board and fitted with casters) and wheel the loaded trucks to a floor scale for weighing.

The empty-weight of all trucks should be painted on their sides so that net weight of the undusted waste can be quickly figured. The waste can then be moved to the feeding end of the dusting machine and an empty truck placed at the delivery end to catch the dusted waste as it comes out of the duster. The waste can then be weighed again and the loss in foreign matter of all kinds computed.

This method requires a lot of handling, increasing the labor cost somewhat. But it gives the cost department a clear daily or weekly picture of any increase or decrease of loss in the form of foreign matter. It also points up any variation in the percentage of loss in clean fiber from the carding operation.

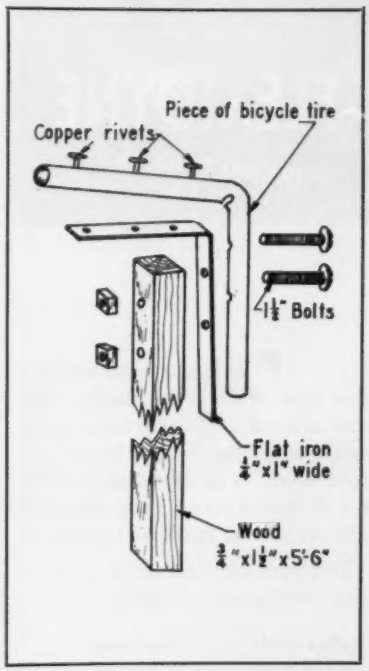
If colors and shades from the blends are kept separate, a large percentage of the card waste can be worked back into succeeding lots. However, waste from blends composed of wool and reworked stock, and containing sharply contrasting colors such as black and white, will be of a far different shade than the roving from the blend. Hence, care must be used when adding such waste to a following lot lest the entire blend be thrown off shade.

By comparing a handful of waste from under the card with the roving coming off the card, one can easily see the difference in shade. Waste from 100-per-cent virgin wool blends will not vary in shade if all the wools are uniform in quality.

Card strippings have very little market value and are almost a total loss. The more efficient the carding operation, the lower the quality of the strippings. But all strippings should be weighed and the total weight entered as a separate item on the waste sheet for the benefit of the cost accountant. When the waste man is unloading strippings from the vacuum tank, he can sort out any chunks that seem worth salvaging and add this to the card waste. But normally strippings are 80 per cent greasy dirt.

TABLE 1

Wt of Stock	Lb per hour prod	Cylinder revolutions per hour	Running time (hr)	Strips and waste	
				pounds	%
1000	50	3900	20	60	6.0
1000	60	3900	16	48	4.8



Waste hook that doesn't damage clothing.

Duster Use. There are two types of dusting machines: cone and box. The cone duster—a long, cone-shape cylinder covered with spikes—receives waste into its small end and by centrifugal force draws it, as it is whirled and beaten, to the large end of the cylinder where it is expelled.

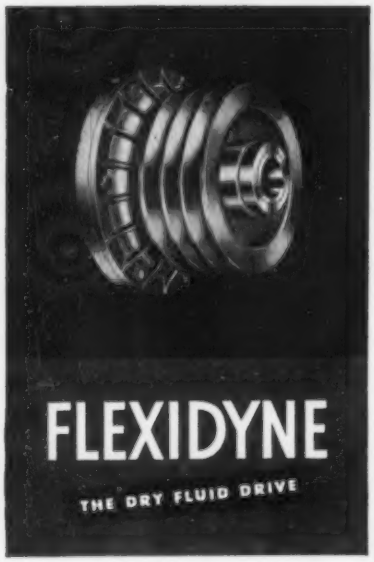
The other type, the so-called box duster, has advantages over the cone duster in that it can be set to give the waste a longer dusting period. In my opinion, the ideal duster is an automatic box duster equipped with a feeder and a powerful suction pipe below the screen grids to carry off all dirt as the waste is dusted.

The waste is dumped in the hopper of this machine, and the automatic assembly set to feed waste into the duster at intervals of two minutes or longer. After the dusting interval is completed, a trap door opens and the dusted waste is discharged. The door then closes and the automatic feeder starts another cycle of delivering another load of waste to the duster.

The suction pipe, at floor level under the screen grid, keeps the space under the machine clear without any attention from the duster operative—trash piled up tightly against the screen grids render the dusting operation ineffective.

Trash drawn away by the suction is blown into a dust bin. Some mills with coal-fired boilers burn the stuff. Others dump it in a gully. In a large mill, one man can handle two or three of these machines.

(SEE FLEXIDYNE DEMONSTRATED AT GREENVILLE...BOOTH 404, ANNEX 1.)



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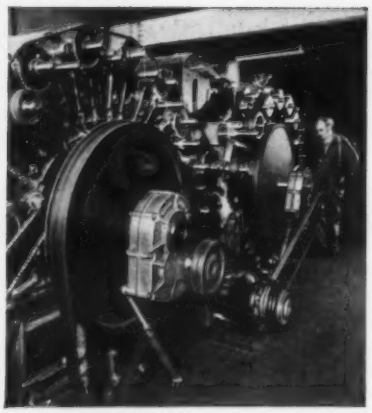
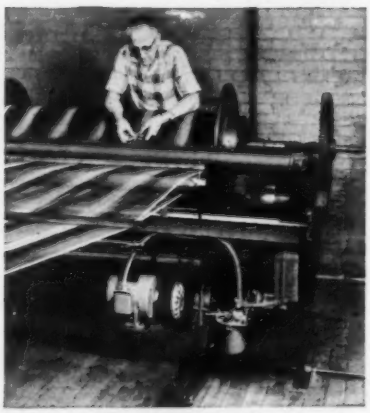
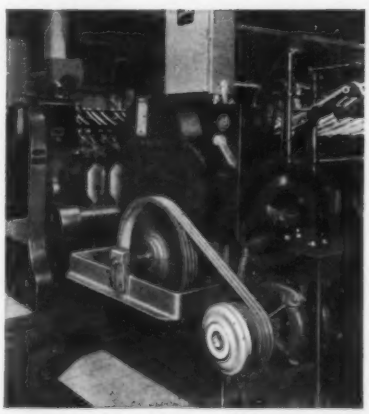


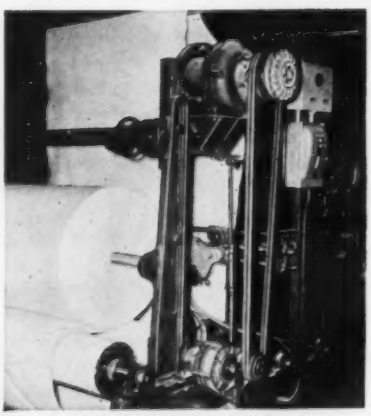
WOOL CARDS



LONG RAIL BEAM WARPERS



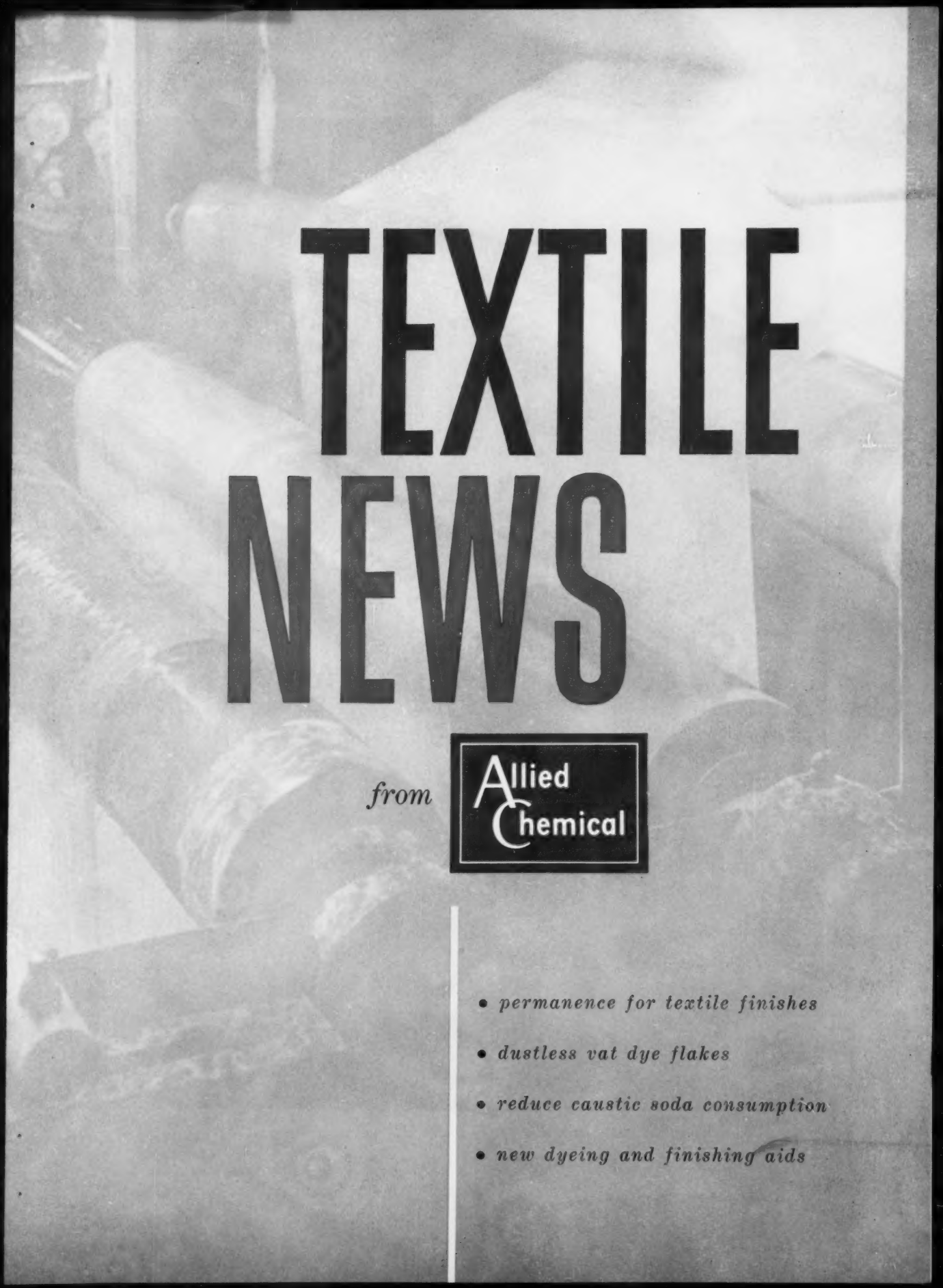
ROVING FRAMES



CORDUROY ROLLING HEADS

DODGE of Mishawaka, Ind.

DODGE MANUFACTURING CORPORATION, 3500 Union Street, Mishawaka, Indiana



TEXTILE NEWS

from Allied Chemical

- *permanence for textile finishes*
- *dustless vat dye flakes*
- *reduce caustic soda consumption*
- *new dyeing and finishing aids*

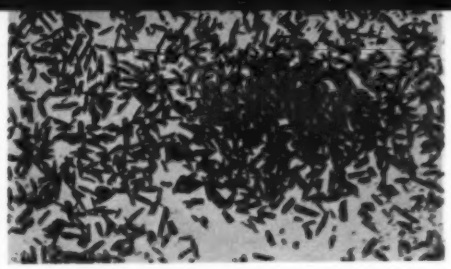
- *new permanence for textile finishes achieved with A-C Polyethylene-based emulsions*

The new textile emulsions now being formulated with Semet-Solvay's A-C Polyethylene benefit every fiber—natural or synthetic—in one way or another over other finishes. Take wash-and-wears, for example. Here, A-C Polyethylene overcomes loss of hand and tear strength when used as a softener along with conventional resins.

Emulsifiable A-C Polyethylene is permanent through multiple cleaning cycles. It increases abrasion resistance and tear strength...imparts extra crease resistance and better sewability.

Your textile chemical supplier either has an A-C Polyethylene finish on hand or can formulate one for your specific use—suitings, dresses, hosiery, curtains, rugs, upholstery. (We make A-C Polyethylene, not finishing emulsions.) Or write us for complete information.

■ **SEMET-SOLVAY PETROCHEMICAL DIVISION**



• *non-dusting vat dye flakes from Allied Chemical permit easier*

When it comes to ease of handling, there's just no comparison between National Aniline's vat dye flakes and ordinary dye pastes.

Because they're dry and stable, the dangers of drying out or freezing in storage, with consequent impairment of dyeing properties or change in shade, are eliminated. Yet they can be poured easily, weighed cleanly and precisely, and dispersed in water in seconds.

Lower costs and tighter control result when you use National® vat dyes. Ask us for samples.

■ **NATIONAL ANILINE DIVISION**

handling, better control

Solvay technician and plant operator check efficiency of Solvay-designed caustic evaporator.

• *how Solvay works with customers to reduce consumption of caustic soda*

As a result of extensive improvement studies conducted by Solvay Technical Service in more than 50 bleacheries, caustic survey techniques have been perfected, mercerizer washing operations have been improved, caustic evaporation cheapened and a dialytic caustic purification process conceived.

From these developments have come drastic cost reductions—reduction or elimination of cloth shrinkage with increased yardage return and improved quality—usually without increasing steam plant capacity.

Textile trained Solvay consultants are available to cooperate with you on this or other "wet" processes.

■ SOLVAY PROCESS DIVISION

Photos courtesy of Fruit of the Loom.

• *leading heavy chemical producer also offers*

fine chemical specialties for better dyeing and finishing

Long known throughout the industry as the number one supplier of such heavy chemicals as sulfuric acid for viscose rayon production and Glauber's salt and acetic acid used in textile dyeing—our General Chemical Division also supplies many fine chemicals that offer important advantages to textile dyers and finishers.

Among these are Baker and Adamson® Zinc Fluoborate Solution, best catalyst for curing epoxy-type textile finishes; Ammonium Acetate, a mordant for dyeing wool and nylon that allows a progressive rather than a rapid and complete change; Cupric Acetate, used as a fix in conjunction with various resins to make textiles wash- and light-fast, as a vat dye catalyst and in fur dyeing.
If the possibilities offered by any of these products interest you, write us for more data. ■ **GENERAL CHEMICAL DIVISION**

• *basic to America's progress*

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• *principal products for the textile industry*

BARRETT DIVISION—BARRETT building materials.

GENERAL CHEMICAL DIVISION—Acetic acid; Muriatic acid; Sodium phosphates; Sodium silicate; Sodium sulfate; Sulfuric acid. BAKER & ADAMSON fine chemicals—Ammonium acetate, Boron trifluoride complexes, Cupric acetate, Cuprous chloride, Sodium bisulfite (anhydrous), Zinc fluoborate, Zinc nitrate.

NATIONAL ANILINE DIVISION—CAPROLAN polyamide fibers—Filament yarns, Heavy yarns, Monofilament, Staple; Fumaric acid; HARMON pigments; Maleic anhydride; NACAN kier boiling assistant; NACCONOL detergents; NATIONAL dyes—ALIZAROL (mordant), CARBANSOL (vat pigments), CARBANTHRENE (anthraquinone vat), CHROMOLAN (premetalized acid), DIAZINE (developed), ERIE (direct), LANAMID (premetalized neutral), NABOR (basic), NACCOGENE (stabilized azoic), NACELAN (disperse), NACROSOL (azo pigment), NIAGARA (direct), SOLANTINE (fast-to-light direct), SOLASTRAL (phthalocyanine pigments), SOLVAT (leuco vat ester), SULFINDONE (sulfur), SUPERCHROME (mordant acid); Phthalic anhydride.

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SEMET-SOLVAY DIVISION—A-C polyethylenes—Emulsifiable for sizing and finishing compounds; hot melt for coating and backing.

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INTERNATIONAL DIVISION—Marketing Allied Chemical products abroad.

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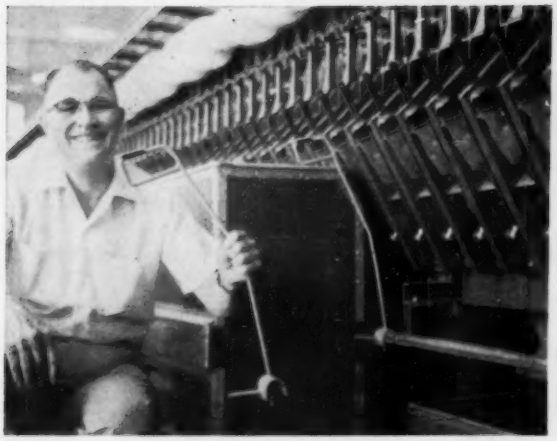


Overseer Young holds a signal stop arm used to anchor doff boxes.

"Rocket launchers" position the doffed cheeses for the creelers.

'How we improved spooling'

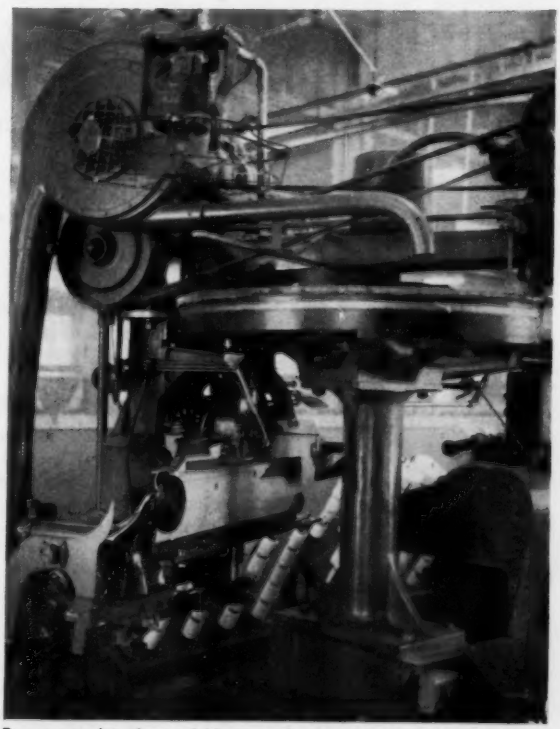
Changing techniques and equipment in cleaning and materials handling upped efficiency

by P. E. Moran
Superintendent, Royal Cotton Mill Co.
Exclusive

AT ROYAL COTTON MILL CO. in Wake Forest, North Carolina, certain improvements and modifications on Barber-Colman spooler operation have proved extremely satisfactory. As great interest has been aroused, many mill men have visited our plant to see for themselves what can be done to make a more efficient spooler operation.

Of particular interest in coarse count mills, or mills running a low twist yarn, is the collection of lint on the rise roller section of the traveler. This condition was eliminated by placing at the head end of the spooler a second air gun equipped with three copper tubes which automatically blow this section of the traveler as it passes. The first air gun at the foot end of the spooler is standard equipment and blows the outside of the traveler as it passes.

An extra tube was built into the fan unit itself, and this serves to blow the opposite side of the spooler as the traveler moves along the track. This helps keep the snick plates clean and also cleans the sides of the running cheeses. Also of help is an extra fan mounted at the front of the blower. Care must be taken to position this fan so as not to whip the ends around the cheese spindles.



Fan mounted in front of blower and extra tube built into blower at right angle to clean snick plates and sides of cheeses.

One of the greatest problems arose when we replaced the bobbin troughs with floating-bottom doff boxes. The fan down-spout, which normally would clean the trough, did not clean all the doff box. At present we are cleaning as much of the doff box as

Lint blown off the cheeses collects on the filter screen at left.

the nozzle will permit. Also, we are cleaning inside the pockets by means of a large copper pipe which is tapped into the down-spout unit.

Floating-bottom doff boxes allowed us to do away with much of the materials handling. An entire doff is put into one of the boxes in the spinning room and is pushed to the spooler.

Trouble developed when these boxes would roll a few inches past their assigned pockets. Sometime a spooler hand would place a wrong bobbin in the pocket, and this caused some mixed yarn.

To eliminate this problem, we mounted a pipe at the base of the spooler to act as a bumper to protect the pockets from the boxes. Every nine ends, or one bay, we drilled a hole in this pipe to receive a removable signal stop arm when the counts of yarn changed.

This stop keeps the doff boxes from rolling and also allows a tag to be placed between the boxes so that the spooler operator will know when the counts do change. This is particularly important on a multiple count spooler on which a different count of yarn can be run at every bay.

To replace the standard trident cart and roller table, "rocket launchers" (our nickname for an inverted spindle cheese truck) are employed. This truck holds sixty cheeses and an extra spindle for receiving the starters at the winder.

The spooler hand doffs and creels directly from this truck. It is then pushed to the winder where the winder hand creels directly from the same truck, eliminating two separate handling operations. This truck is now available from several truck manufacturers.

On all spoolers, another common complaint is the amount of lint that collects at the point of storage. To blow cheeses off without contaminating the room with lint, we built a small room with a large exhaust fan on one side. The fan runs continually behind a wire screen that acts as a filter for the intake side of the fan.

As the trucks are pushed from the spooler to the winding room, they are run into this room where a blast of air from a blow pipe cleans the cheeses and trucks. The loose lint accumulates on the filter and is easily cleaned off. By having the fan inside the room, it is not necessary to exhaust the conditioned air to the outside of the mill.

Some of this equipment can be purchased directly from manufacturers and, with only slight modifications, can be made to do an excellent job. Other parts will have to be made in the mill shop at no great expense. By employing these briefly described aids we were able to cut costs and improve quality considerably.

So you don't want a union? Try these preventive measures

by Granville M. Alley, Jr.

Abstract*

■ THE BUSINESS MAN always asks: "What can I do now to prevent my company from being unionized?" In my opinion, organization is not inevitable. Whether you are going to be organized by the union is up to you. The decision is yours. If you don't want to be, you won't, if you are willing to take the necessary steps.

*From a paper entitled "Failure of Management in Industrial Relations" presented during the recent annual meeting of the Underwear Institute. Mr. Alley is a member of the Florida law firm of Fowler, White, Gillen, Yancey, and Humkey.

Here are ten recommendations for those who desire to continue in their pleasant state of being unorganized:

1. Recognize the problem and start working on it. You may think your employee relations program is in top shape, but don't think it—be sure.

2. Strengthen your supervision. Get rid of supervisors who play favorites. They should be chosen on their ability to deal with people—not the ability to manually do the work themselves.

3. Keep employees informed about what is going on at your company.

4. Discharge every employee who is doing a poor and unsatisfactory job.

5. Treat employees as individuals by giving them recognition.

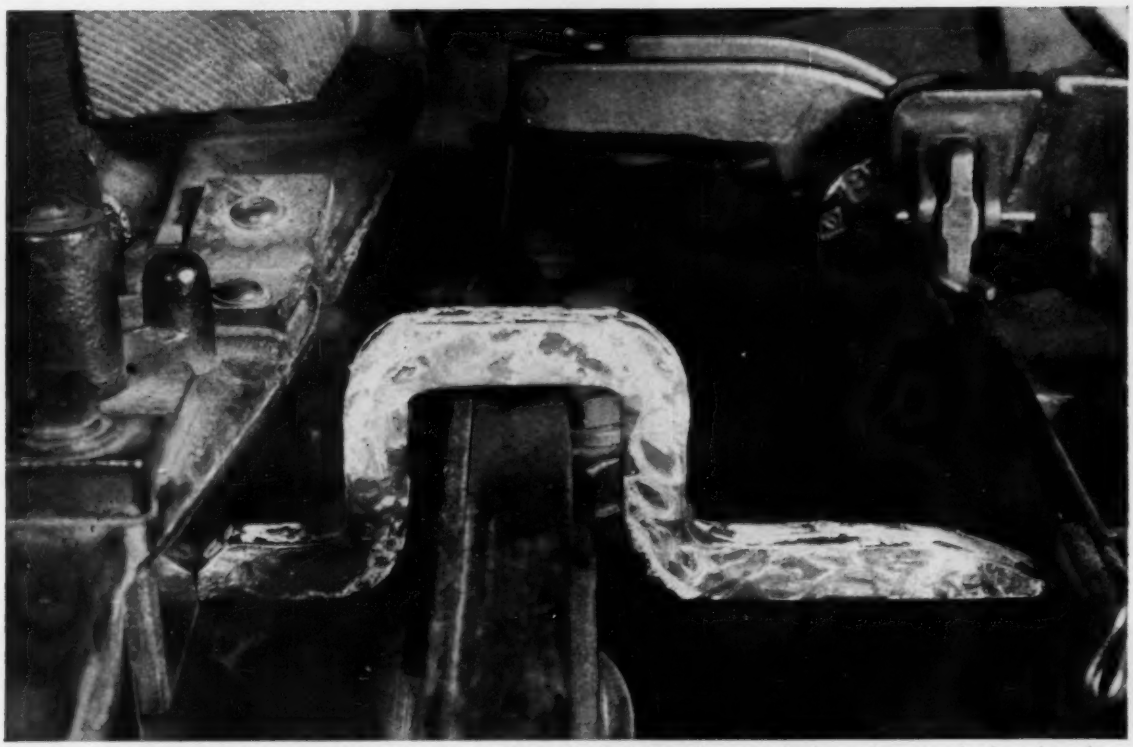
6. Eliminate pay differentials between employees in the same job classification.

7. Develop among employees a method of upward communication which will alert you to any organizational drive.

8. Work out now a program of the steps you will take should a union organizer move against your company.

9. Realize that union organizers are specialists and that to deal with them you need a specialist.

10. Work with management of other companies in your area and cooperate with them in the solution of this common problem.



The "hump" gauge, or pick timing gauge, lay, in position between the back box plate and the breast beam at the front loom horn.

GAUGES in Draper loom maintenance

Why loom gauges are needed in the mill and how to use them

Article 7—Finding and keeping adequate picking power*

Staff prepared Exclusive

IN THE not-so-long ago the overseer hired a loom fixer to "keep up a section of looms" with a minimum of attention (or instruction) from supervision. If the fixer failed, the overseer usually replaced him with another fixer on the same terms.

If that system seems a bit riotous, it is because it was a bit riotous most of the time. But out of the groundwork that system laid have grown today's fixers, overseers, and loom builders—thus it is with good reason that we look back at them with respect . . .

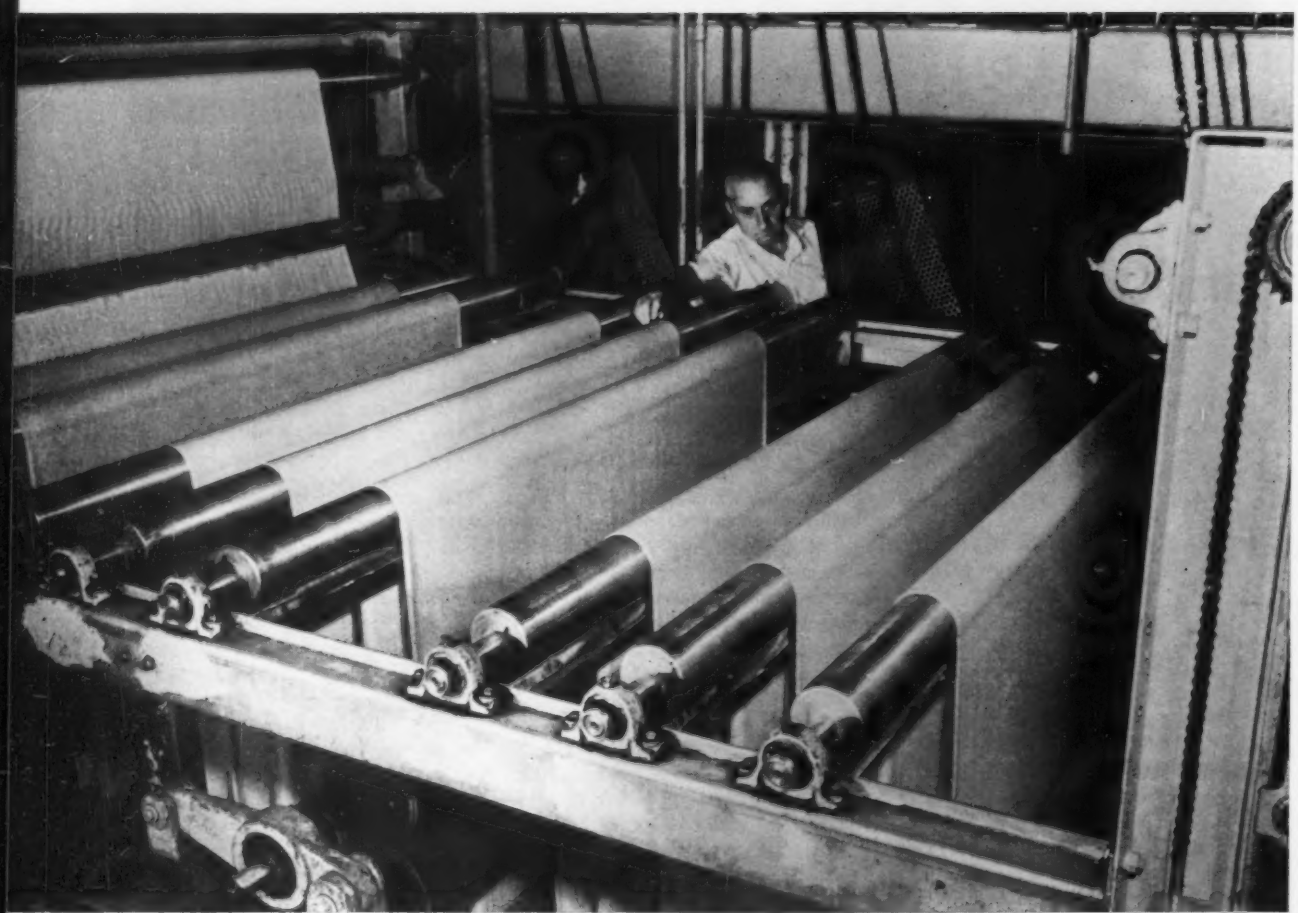
To start a belt-driven loom on a heavy fabric required a lot of muscle, black magic, and luck. Often the ritual included picking the shuttle into the left-hand box, releasing the brakes, turning the loom by hand to back center, tugging the right-hand check strap as far toward the center of the loom as it could be pulled, whispering one's favorite (and most powerful) incantation, and then in one complex move: (1) grasping the lay with one hand; (2) snatching the shipper handle to the "on" position; and (3) tugging the loom through the first pick. With luck the belt would then take over.

Looms knocked off with the same happy abandon. No amount of coaxing would ship a belt to the loose pulley in time for the power to be off when the brakes came on, so the brakes often were left out of the running after the new wore off or the "cork stoppers" used for linings wore out.

When a warp end or the filling broke, the loom usually coasted until the shuttle failed to box and the protection caught it. (The chap who first suggested that a loom could be timed to stop with the harnesses level and with the shuttle neatly boxed must have been

*The first article in this series was published in the January, 1960, issue. Parts 3, 4, 5, and 6 appeared in the February, March, May, June, and July issues, respectively. After the complete series has been published, the articles will be reprinted in book form.

Roll, roll, roll your bolts gently o'er the Stainless



Time and again, this plant had to replace parts in the carbonizing unit because the materials couldn't withstand the sulfuric acid solution that helps remove burrs and bits of grass from semi-finished woolen fabric. Nine years ago they put in Stainless Steel and practically eliminated replacement costs. The Stainless Steel parts are still going strong. Plant Engineers expect them to last at least 30 more years.

This mark tells you a product is made of modern, dependable Steel.

With this plant's old style dye kettles they were limited to only one shade because the vats couldn't be thoroughly cleaned to allow for a different color. Now they have Stainless Steel equipment and all they do for a color change is flush out the dyeing units. There's no color carry-over. No residue to foul up a new batch.

Here in this plant, highly corrosive chemicals ate into the old equipment and left the surface rough and pitted. This surface became abrasive and sometimes shredded the fabric. They installed Stainless Steel equipment and now there's no torn fabric or contamination problem. The company has virtually eliminated product rejections.

Specify Stainless Steel equipment and repair parts for your plant. No other material can match the performance or product purity of USS Stainless Steel.

USS is a registered trademark

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United States Steel

dispatched to the nearest psychiatrist.)

To get a loom to pick properly often extended even the veterans. Sometimes the cam hubs on an old loom could be jammed against the cam shaft boxes without getting them near enough to the pick shafts to give adequate power. So the veteran would place thick cut washers between the hub and the cam to set the latter a fraction of an inch closer to the pick shaft.

And sometimes he, through sheer cantankerousness, would remove the same washers when he quit the job or was moved to another section. "Let the next fixer find the trouble. That's what I had to do" he often muttered.

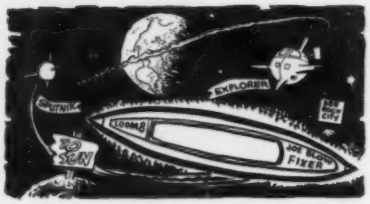
Small wonder a man had to be checked in through the ranks as sweeper, filling hauler, weaver, and smash hand before he could prove he could "take it" as a fixer. They had to be super sleuths, too, to trail a defect from the cloth room back to the reason for its existence. But they did it.

Back again to those belts. In lean years management cut supply budgets to the bone, and the expensive leather got its share of the cut-back. So the extent of a mill's poverty could soon be read in the number of buckles needed to keep the belts going. And some of the fixers would swear they shortened a slipping belt by taking out another buckle.

The fixer cut his picker sticks to length, dressed the ends of them to receive the leather loop picker, and bored the picker with his pocket knife. When heel straps became scarce, the supply room often passed out scrap leather from which he cut his own.

Then, one day the first of the X series appeared and ended an era in loom fixing, for that sleek model could sustain its "impossible" speed only through being erected and maintained with gauge accuracy. Equipped with individual motor, the loom could be started with a simple tug of the shipper handle—and the power could be knocked off before the brakes came on. (And the fixer who had been scorned for dreaming that a loom could be timed to stop with the harnesses level and with the shuttle in the left hand box was quietly made foreman.)

The fixers with a little poetry in their make-ups grinned admiringly at the plucky little loom's ambitious speed; the not-so-poetic looked on with there-ain't-no-such-animal expressions, shook their heads. Presently there was a demand for gauges that would make the Model E run that way.



Loom Power Needs—General

Stroke, Lug Height, and Pick Arm Length. Less and less is being said about stroke, because if the picking motion is kept in good condition, the stroke is cared for almost automatically. But it has not always been so.

Pick shafts formerly could be moved forward to position the cam ball more directly over the cam to gain added power. But the newer looms have pick shaft boxes recessed in wells in the loom side to prevent such movement. Thus one source of added power is eliminated in the X-series.

Floating washers may be added to remove end play from these newer pick shafts without changing the cam ball position enough to count. Too, the later models are equipped with grease fittings that permit adequate lubrication of the pick shaft ends and pick ball. These parts simply do not wear out as fast as they did on the Model E, and as a consequence they hold their settings longer.

The lug height has long since been a rich source of conflict between the fixer and the boss. To the fixer it is convenient "throttle" through which he can apply almost unlimited power to the shuttle, quickly but without regard to such niceties as timing.

True, if the picker stick holds, the fixer can practically put a shuttle into orbit just by dropping the lug holder down to the heel bolt. But the power thus demonstrated causes a loom to grind itself to powder for no good purpose.

The lug strap is best kept "above a level" or with the outer end higher than the end secured to the pick arm, for power is not the only consideration. The parallel motion is designed to receive force applied downward and toward the center of the loom, and a force applied upward and toward the center completely foils the purpose of the parallel motion —keeping the picker moving parallel with the lay end. The design also fails to accommodate wear from that quarter.

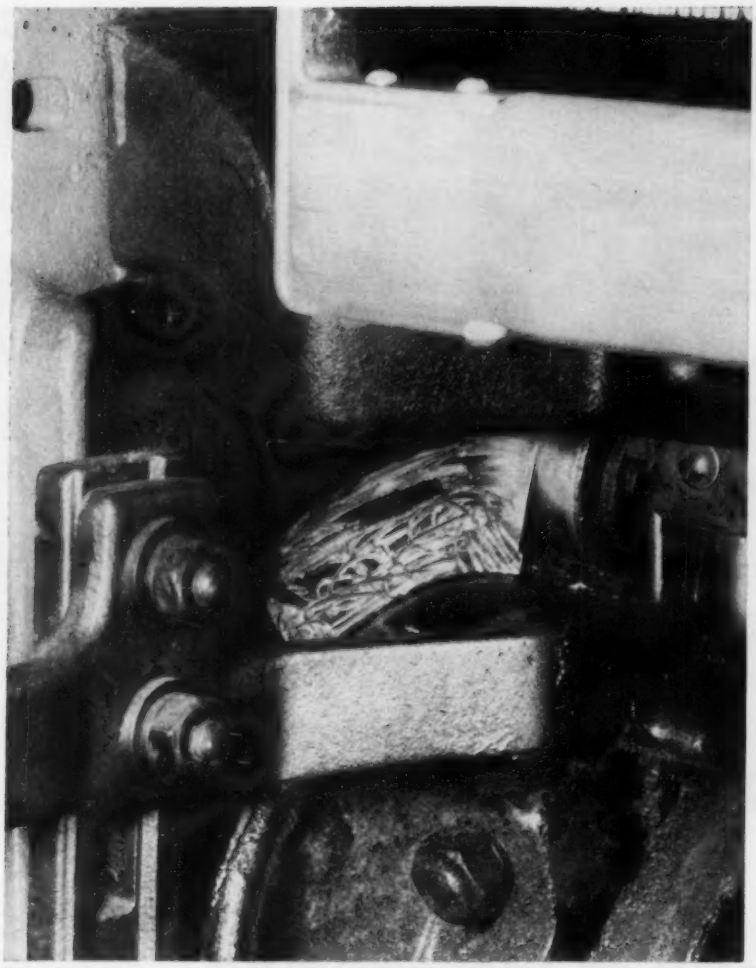
A late design in this motion fixes the lug strap height so firmly that the fixer can rebuild the picking motion easier than he can change the lug height. So that leaves the pick arm as a single source of adjustment for wear and loss of power, and this "throttle adjustment" must be limited judiciously to keep excessive power off the loom.

The loom builder will supply a pick arm of whatever length the overseer requests, so it is left to that supervisor to secure arms of the proper length or, if necessary, to limit the existing ones by plugging the slot to leave only the necessary amount of movement.

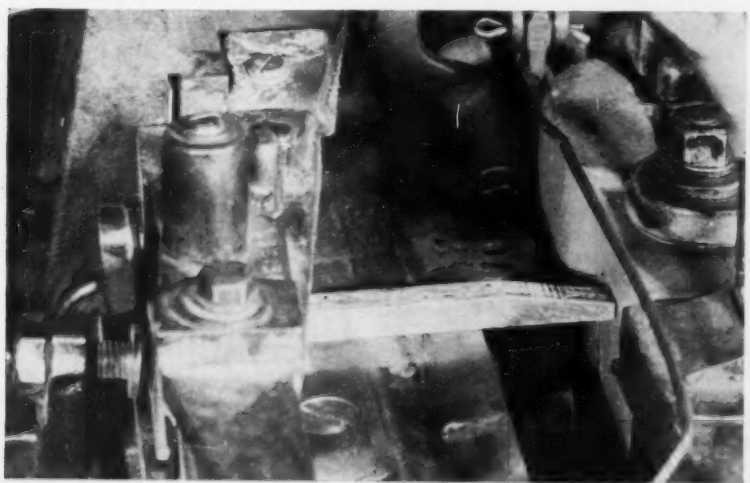
Since this arm is a short member of the picking motion, a relatively slight change in its length usually is sufficient for all the power changes a fixer is likely to need if he reconditions his looms on schedule.

This setting on a reconditioned loom should be made with the pick arm set at its shortest. It should need no more than a ½" extension before the loom is scheduled for another reconditioning. All other power settings should remain unchanged for the period.

The loom builder determined the proper stroke for each type of loom, and this amounts roughly to enough picker sweep to push the



Pick timing gauge, cam, in position against pick ball with gauge lip touching cam pocket.



Lay gauge, in place between box back and breast beam, marks limit of forward lay travel.

shuttle free of binder action as the loom is turned by hand—no more. By using the full sweep permitted by the binder action, applying picking power through the greatest distance possible, the loom builder is able to give the shuttle its needed speed with the least possible force.

When something happens to cause an appreciable drop in this sweep, the needed picking force is applied through the shorter distance and is consequently greater. This multiplied power takes its toll of loom parts and can be felt as a shudder in the lay.

This lay shudder (hesitation may be a better word) is a symptom of too much power, whether caused from too-short stroke or not, and it must not be confused with the grinding feel imparted by rough head gear, driving gear, loose crank arms, etc.

The stroke seen as a loom is turned by hand is not the stroke utilized by the running loom. Under stroboscopic examination, the shuttle may be seen leaving the picker some distance before the shuttle reaches the limit of binder action. But since the two are related, the present method of viewing it in slow motion (by hand turning) is sufficient.

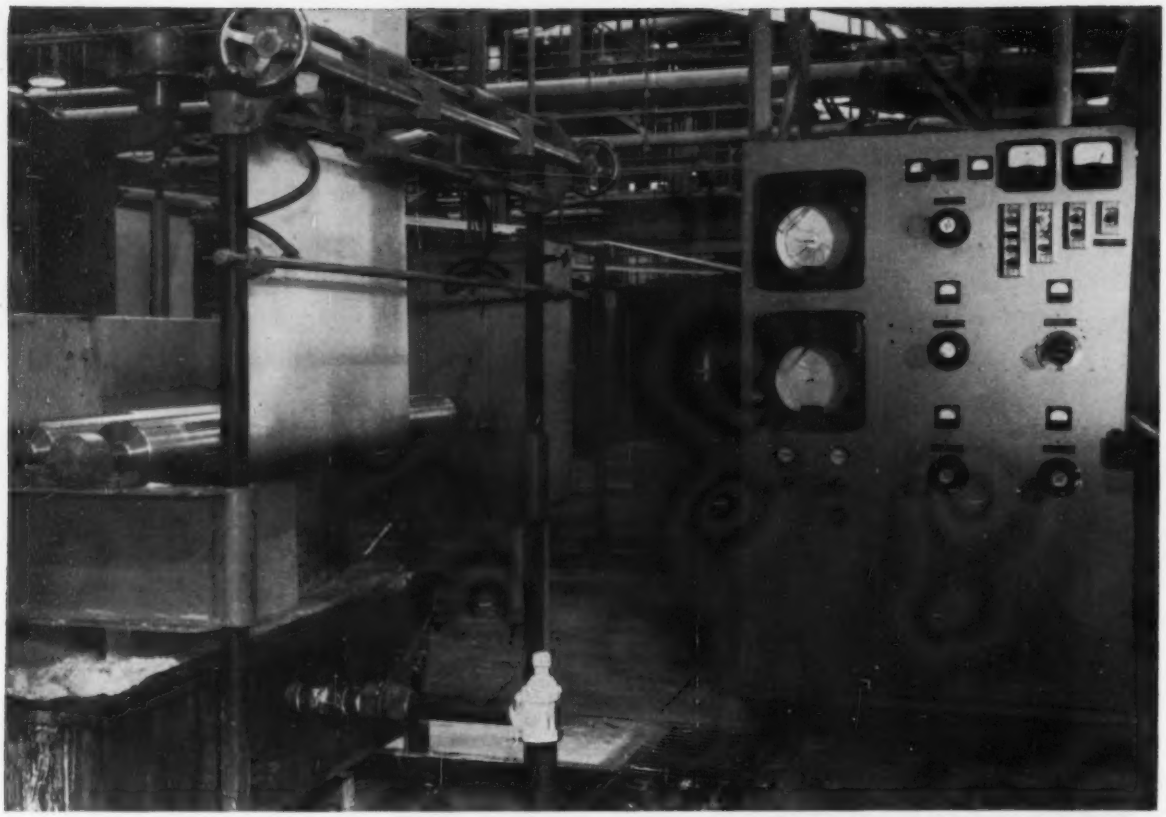
It all boils down to stroke being fairly well built into a new loom's make-up, and as long as the loom is maintained properly, stroke remains very much an automatic quantity. But it is not automatic enough to be dismissed or ignored.

It is a good indicator of picking motion condition, since it shortens as the picking motion wears, especially as the pick cam toe wears and is unable to move the pick ball through its original arc.

Eventually this toe wear is so pronounced that when the loom is positioned with the pick ball on top of the cam toe, and the lug is shortened to hold the picker to the predetermined stroke, the pick cam will stop the pick ball before the picker stick reaches the end of its slot. This forcing of a stroke measurement is fatal to high-speed loom operation and is not likely to breed respect for the boss who demands it.

Of course there are many other sources of stroke loss, as anything that prevents the pick ball from sweeping through its original arc, and from transmitting the motion undiminished or unimpaired to the picker, will present a similar condition. Slack lugs and a pick shaft working upward from its correct position are frequent offenders.

(to be continued)



Foxboro Density Control on Mercerizing Saturator at Grace Bleachery, Springs Cotton Mills, Lancaster, S. C.

Springs Cotton Mills improves uniformity of mercerizing...

Foxboro Automatic Caustic Density Control pays for itself

Caustic strength is maintained right where it's set at Springs Cotton Mills' Grace Bleachery, Lancaster, S. C. It's done simply and automatically with a Foxboro Caustic Density Control System.

This system eliminates hand-sampling, log-keeping, guesswork—produces better mercerizing through high uniformity of treatment. Changes in mercerizing speeds, or complete shut-downs, do not affect caustic strength of the bath.

And best of all, since it completely eliminates caustic overcharging, this Foxboro system will pay for itself in a matter of months on caustic savings alone. Little wonder Grace Bleachery now has *all 6* of their mercerizing ranges under Foxboro control.

This cost-cutting, automatic Foxboro system can be installed on new or existing equipment without interrupting operations. Get full details in engineering data sheet 220-8. **The Foxboro Company, 4811 Neponset Avenue, Foxboro, Massachusetts.**

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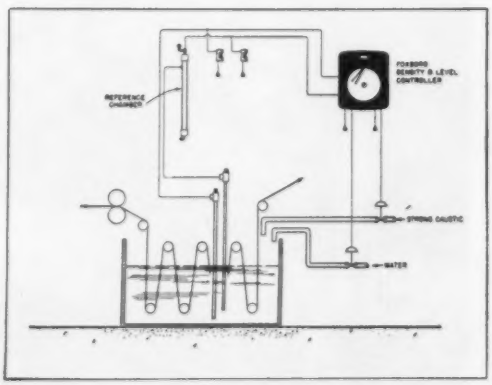
REG. U.S. PAT. OFF.



Typical application of Foxboro Density Control

Foxboro Density and Level Controller records accurate measurements of caustic density and liquid level. Controller also positions strong caustic and water (or weak caustic) valves to maintain set values.

The Starnes spinning system

Model does spinning and winding in simultaneous operations

Staff prepared Exclusive

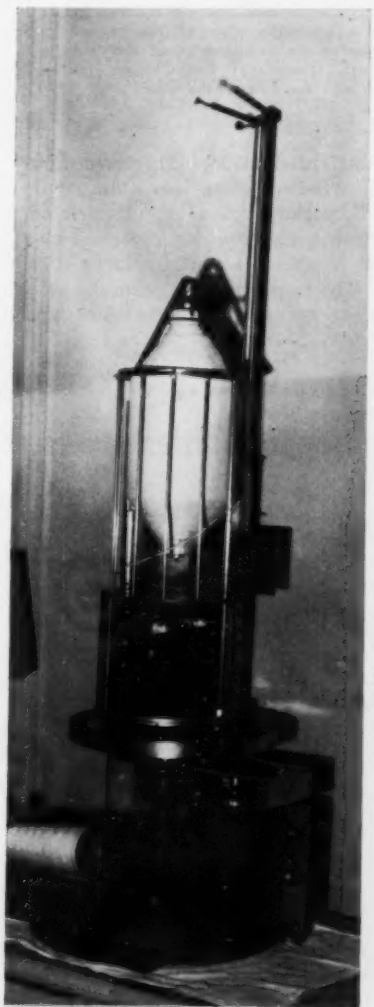
NOT ALL the latest in spinning equipment made its way onto the exhibition floor at the Atlantic City Show in May. On top of a chest of drawers in room 1133 of the Ritz-Carlton Hotel stood a single-spindle spinning frame that went a step beyond the prosaic and wound its finished yarn neatly onto a cone. One inspected the prototype only through invitation of its inventor, Earl Starnes, an engineer with Russell Manufacturing Company, Alexander City, Alabama. The system is simplicity itself.

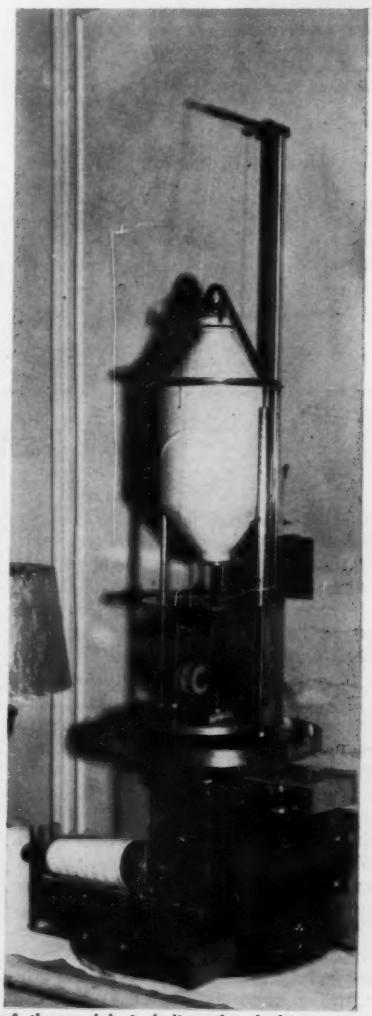
An electric motor and a short shaft (in ball bearings) are mounted vertically on a small pedestal, the motor driving the shaft through a small V-belt. A short section of the top of the shaft is turned down to receive a Plexiglas disk approximately ¼" thick. The portion of the shaft extending above the disk is fitted through another ball bearing that supports the "creel" and the drafting unit. A small worm gear at the top of the shaft provides a power take-off point for driving the double apron drafting system into which the shaft extends.

A hole leads from the outer edge of the disk along the radius to the center, continues through the wall of the shaft, and turns upward into the drafting unit, the disk acting as a flyer and inserting twist as the end moves through an eyelet at the top of the machine and downward to the winder.

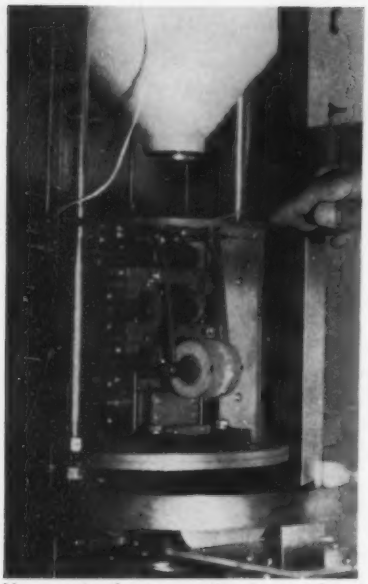
Two powerful permanent magnets mounted below the flyer pass their magnetic fields through the flyer to grip the metal plates forming the base for the creel and drafting unit to prevent their spinning along with the flyer. The plastic does not break up the magnetic field to make a generator of the spinning "frame."

Despite its many crudities—after all, it is a prototype—the model presents several obvious advantages over conventional spinning: (1) there is no traveler to skin yarn, create fly, wear, become loaded and break an end; (2) there is no ring to impose speed limits, wear and cause trav-

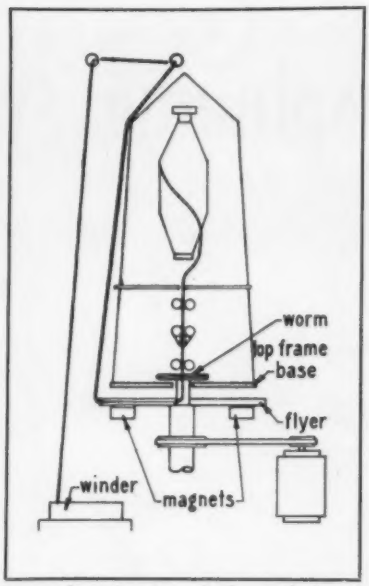




Prototype of the Starnes Spinning Method with the winder situated at the base of the unit—earliest model positioned the winder above the roving package. The top of the model, including the drafting unit, has been rotated approximately 180 degrees to show the manner of unwinding the roving. Above picture shows normal position.



Here again the top portion is turned out of position to allow easy view of the drafting unit. The flyer is surrounded by the large hoop just above the motor. Above



is a schematic view of the method and showing the relationships of the important parts. Centrifugal force throws the end through the hole in the flyer.

eler drag to break ends; (3) the twist is fully protected, free to run to the bite of the rolls, and enough yarn is exposed to allow the twist to even out as in mule spinning; (4) the balloon remains of constant length, imparts low, constant tension; (5) conventional winding costs are eliminated; (6) package size is unrestricted, six-pound units being normal and these almost without a labor cost.

The unit produces yarn at a rate 40 to 50 per cent higher than the standard production tables reflect, and its performance is so high that the yarn is practically free of gouts, slubs, etc.

In fact, the yarn is ready for many end uses, can be taken directly from the package without further slubbing. Where slubbing is required, the cost is negligible because of the six-pound supply packages.

The inventor (the method is thoroughly patent - protected) points out that numerous details must be resolved before the prototype can become a production member—refinements in balance, type of drive, method of gang-mounting to minimize floor-space utilization, maximum use of false-twist mechanism to permit production of very low twist yarns, stop motion, and the type and arrangement of drafting unit. But with the prototype's performance already on record, these problems remain matters of refinement, indeed.

Both machinery and textile industry leaders received the unit enthusiastically. Many have voiced the belief that it spells a breakthrough in the quest for spinning automation.

Textile opportunities stressed at employment seminar

■ THE TEXTILE industry welcomes competent men and takes good care of them over the long term, it was emphasized in and during the employment seminar at the 57th annual convention of Phi Psi Fraternity in New York City.

The panel discussion, led by Douglas F. Grady of Pepperell Mfg. Co., covered every aspect of the textile employment picture, from recruitment through training and promotion.

Two phases of executive development, in-company training and self-development, were stressed by Allen Morris, director of sales training and executive development for Burlington Industries, Inc. Said Mr. Morris: "We in Burlington are firm believers in on-the-job training after a brief formal orientation period; but any training program provides only the framework. The executive trainee must decide for himself how high above the plateau of security he wants to go. Then, with these self-imposed and self-inspired goals he can direct himself to their achievement."

Lewis Benton, director of personnel at M. Lowenstein & Sons, whose topic was "Going Outside vs. Promoting From Within," decried the policy of some companies to disregard talent within their own organizations. "We don't recruit nor do we advertise, but we get more trainee applications than we can accept. This is because our firm policy of promoting from within has become so well known in the textile industry."

Mr. Benton said that going outside indicates a lack of management planning and is most discouraging to insiders who must have hope for advancement in order to function effectively in their present positions. "The best example of our promotion policy is our president, Everett Drake, who started at $13 a week and learned the business from the bottom up—largely on his own time and on his own initiative outside of working hours."

On the question of whether textile school graduates or those with non-technical degrees are better fitted for textile jobs, Marshall Palmer, director of administration at J. P. Stevens & Co., came out in favor of the textile graduates. Limiting his remarks to "sales-engineering" positions in New York, Mr. Palmer said, "Our job in New York is to service our customers, and we feel the men who can do this best are those who know most about our products and how they are made. We employ general college graduates, and in some areas, such as domestic products, they are just what the doctor ordered. But in other departments, such as industrial and specialized textiles, we find that the textile college graduates get off to a faster start."

Gin-damage research intensified

USDA pilot spinning plant joins industry, National Cotton Council efforts

Highlights of the National Cotton Council's recent marketing conference in Atlanta

Staff report

■ RESEARCH is under way to determine the effect gin damage has on the spinning performance of cotton, and this time the research arm of the Agricultural Marketing Service is making the studies, with financial aid from the National Cotton Council.

Using the pilot spinning plant at Clemson College as the laboratory, the USDA follows through on a program begun in 1957. In the fall of that year, the department's Cotton and Cottonseed Research and Marketing Advisory Committee recommended that the department appoint a special industry-USDA study group to draw up a program of research directed at remedial action for problems related to "cotton harvesting, ginning, drying and cleaning methods." In September 1959 the first research lot of cotton started through the 1000-spindle spinning facility at Clemson.

The full array of objectives set forth in the beginning has not changed, according to Dr. Omer W. Herrman, Deputy Administrator of Marketing Research, AMS, in his paper entitled "Adjustments to Changing Conditions in the Cotton Industry," which he gave at the meeting. The objectives are:

1. To obtain a true evaluation of

Ernest Carpenter, Greenwood Mills, displays custom-ginned samples during panel discussion devoted to the impact of custom ginning on cotton marketing. Other panelists shown are **Bob McCallum,** Geo. McFadden & Bros.; **Ray Provost,** Producers Cotton Oil Co. One specific effect of custom ginning is less neppiness in raw cotton and yarns and finished fabrics, Mr. Carpenter said. Also the cotton generally is improved in staple length and in uniformity of fiber length. Reductions are noted in pin leaf, seed tips, and seed coat fragments. "We hope the day will come when cotton mill buyers generally will learn to pay proper premiums for 'true values' in cotton and similarly will discount cottons that have been damaged by harvest-and ginning practices," he concluded.

a cotton's manufacturing performance

2. To evaluate the effect of various ginning practices and ginning equipment on the spinning performance of cotton, including drying, cleaning, etc., and to guide researchers in developing equipment and operating techniques which will preserve the inherent quality of cotton

3. To evaluate the effects of various production and harvesting practices on the spinning performance of cotton

4. To evaluate the economic effects of various production, harvesting, ginning, marketing, and spinning practices on the end-use value of cotton by following it through each step on its way to the consumer

5. To evaluate the present physical cotton standards with respect to spinning performance and product results

6. To guide the development of practical, inexpensive instruments that will objectively measure cotton quality

While the above list of objectives is quite comprehensive, and while each item represents an area in which a staggering amount of work can well be done, there apparently is no immediate relief for the spinner —he still is likely to be stuck with a batch of cotton that runs poorly. Seems he still has to prove it, though, with something other than spinning performance records.

And that brings on more talk, as the following pages reflect—some excerpts are included in an effort to reflect a bit of the atmosphere of the meeting.

The Problem Briefed. "Obviously, our industry's future depends heavily on what we [National Cotton Council] do, or what we fail to do, in research. And this is nowhere more apparent than when we look at the whole complex of critical, elusive problems that you are here to talk about today.

"These problems, which are usually lumped together under the broad heading of 'quality preservation and evaluation,' stretch from one end of the cotton industry to the other. They are of direct, immediate concern to producers, ginners, merchants, and spinners.

"But the heart of the whole complex of problems comes down to just one thing: namely, a lack of knowledge about what makes up the *true* use-value of a bale of cotton. And the only way we're going to get this knowledge, and be able to apply it is through research.

"A lot of things have been happening in the cotton industry since the old days when a bale of cotton could be fairly well judged on the basis of grade, staple, and preparation . . . mechanical revolution on the farm . . . ever-growing volume of machine-harvested cotton with higher trash and moisture content . . . modern-day ginning, with elaborate cleaning and drying set ups . . . misuse of some of the new ginning equipment . . . the concurrent speed-up in cotton mill operations, which imposed greater demands than ever on cotton . . . the rising tide of complaints from spinners, here and abroad, who said that while cotton might be up to par in grade and staple, some of it just wasn't running up to par in actual mill operations . . .

". . . It was apparent that a significant, growing volume of cotton was being subjected to some kind of damage. But we didn't know the nature of the damage; we often couldn't see it; and we certainly couldn't measure it or reflect it in the marketing system with any of the fiber classing or testing methods available to us . . .

"We could and did mount a far-reaching educational campaign aimed at minimizing fiber damage . . . campaign . . . played a major role in holding down the incidence of fiber damage . . . and is being stepped up . . .

"But the Council has always recognized that the ultimate solution must come through research which would have to do two essential things: first, it would have to pin down the exact nature of the damage; second, it would have to give us instruments and techniques for measuring that damage—on a practical basis—so it could be reflected in the everyday buying and selling of cotton . . . until we can measure cotton's real spinning value rapidly and dependably, we will have a quality problem . . . A large, growing research effort has been developed . . ."—Wm. Rhea Blake, executive vice-president, National Cotton Council.

New Techniques, Aids. The address, "New Aids Needed to Select Cotton for Specific Uses," given by J. N. Little, Anderson, Clayton & Co., pointed out that cotton marketing is carried out under two systems, one standard of which determines the price paid the farmer (which bears on the Government support price). The second standard of quality is the cotton's spinning value to the mill.

". . . The mills would like to know that the price of cotton of a given type will reflect accurately the spinning waste that can be expected, the processing performance of the cotton in the mill, and the quality of the yarn or fabric that can be produced. At least one—and, in many cases, all three—of these quality factors requires a considerable amount of guessing at the present time to predict spinnability, even if laboratory instruments are used in addition to the skilled judgment of the classer. . . . There is a need for a laboratory instrument which can rapidly, accurately, and economically measure not only the foreign matter of a sample of cotton but the short fiber content as well . . .

"Color can be measured with such instruments as the Nickerson-Hunter Cotton Colorimeter and the new version of this instrument being manufactured by Spinlab, as well as the Scanor-tron developed by the U. S. Testing Co. . . .

". . . The mills would also like to know the type and size of trash in the cotton and, more particularly, the ease with which this trash can be removed during opening, cleaning, and picking. Efforts to measure the type and size of trash are being made by the U. S. Testing Co. and also by the U. S. Department of Agriculture with their Trashmeter [for a complete report on this instrument, see TI for August 1960, p 133]. If these machines prove to be economical, it would still be desirable to have an instrument capable of measuring the ease with which the cotton can be cleaned . . ."

Mr. Little continued with the assertion that ginners could make good use of two existing instruments that give readings on fiber diameters and moisture content — the Micronaire and the electrical moisture meter marketed by U. S. Testing Co. (made by ACCO Fiber & Spinning Laboratory). Neither instrument requires much time per test, and they would prove valuable in assisting the ginner to adjust his process according to diameter and moisture, to give maximum cleaning and to prevent fiber damage from too much beating and drying.

Some of the advantages of Micronaire readings are cancelled in the plant because of the presence of the damaged fiber introduced by too much gin drying and cleaning, and some means of measuring this damage is urgently needed.

One approach, in keeping with current thinking on this problem, is to measure the percentage of fiber length below ½" and use the result as a means of approximating gin damage. A recent paper on the subject, printed in TI, August 1960, p 125, shows a very high correlation between the short fiber content of

cotton and such factors as ends down per 1000 spindle hours—Lindsay Dexter and Richard Sweeney, both of Pepperell Manufacturing Co., used the Digital Fibrograph in preparing it.

Under development are several means of measuring short fiber content accuraaely and quickly. And while such instruments are or would be useful in helping the mill man with the problem of short fibers as they are related to processing efficiency and waste, their real promise will be in their ability to help prevent such damage.

Finally, sampling methods are to be revamped if results are to be reliable. The automatic samplers of today are much opposed in trading channels, and there is still a pressing need for a means of taking a sample that is representative of something more than the cotton near the outside of the bale.

Custom Ginning Pros and Cons. Custom ginning is the practice of ginning cotton according to terms set by the buyer. Ernest Carpenter, manager of Greenwood (S. C.) Mills' cotton department had this to say of his experience with such:

"Generally the cotton was improved in staple length and in uniformity of fiber length. Some observed improvements of 1/32" to 1/16". One contractor was quoted to the effect that the short fiber content of his cotton was reduced to less than half of that found in typically over-dried cotton. This is important to a mill.

"Reductions were noted in pin leaf, seed tips, and seed coat fragments . . . The cotton resulting from this type of custom ginning produced stronger yarns in the mill and processed better. This means good weave room production and few ends down in the spinning room, all of which adds up to more efficient processing qualities.

"Classers preferred these custom-ginned cottons. It has better character, has a good 'drag,' and is not brittle. It has an oily, waxy feel that is generally preferred by classers . . ."

But since custom ginning permits the buyer, at a price of course, to name the conditions under which his cotton is ginned, the system represents a return to the "good old days," and the ginners are not sold on its long range values. In fact, two major doubts are voiced by Kemper Bruton, Arkansas-Missouri Ginners Association:

". . . First, can the ginner, because of the impact of an increasingly fast harvest and the absolute need to get the cotton ginned under all conditions of trash and moisture content, live up to such contracts? Second, isn't there great danger of wrecking our whole system of marketing and further damaging our reputation by beating the drums about an untried, haphazard set of ginning standards, the economics of which have not been demonstrated?

"It seems to me that we should turn more attention, time, effort, and money to securing the accurate definition for quality. And then do everything in our power, collectively, to secure simple scientific instruments to measure those qualities . . ."

Recognize True Values. E. W. S. Calkins, U. S. Rubber Co., Winnsboro, S. C., stated forthrightly: ". . . you have heard a lot of talk about what the mills want in fiber properties, and a lot more talk about what they do not like in modern harvesting and ginning methods. What we want is good staple length, medium to high Micronaire, high fiber strength, and a minimum of fiber damage at the gin. But what the grower gets paid for is high yields per acre and high grades. We can fill the air with talk for another fifty years (if we are able to stay in business that long) but talk won't change the situation. It is time we either put up or shut up . . .

"What we need is a system of premiums and discounts for Micronaire, fiber strength, and possibly per cent short fiber, just as we have them for grade and staple . . ."

Mr. Calkins dwelt at length on such factors as Micronaire readings, short-fiber content and fiber strength and translated their meanings into the mill man's lingo of product quality and operating performance. He pointed out that mill men should be able to buy those qualities in the bale. He suggested that the recognition of the true values in cotton should start as a contract between one mill buyer who knows what he wants and is willing to pay what it is worth and a cotton merchant who will supply it.

"Once we make a start," he said, "supply and demand will take care of whatever adjustments [that] may be necessary." As proof that he practiced "putting up," he proposed the following trade rules for the "recognition of the true values in cotton."

1. A shipment shall be accepted by the buyer if its average fiber properties do not differ from the specified values by more than one-tenth Micronaire unit, one thousand pounds in fiber strength, or one per cent by weight of fibers under one-half inch in length.

2. No individual bale in the shipment shall differ from the specified average by more than two Micronaire units, ten thousand pounds, or ten per cent short fibers.

3. If the average fiber properties of the shipment differ from the specified values by more than the amounts stated in *Rule 1*, the buyer may at his option either reject the lot and require the seller to replace it with suitable cotton, or demand of the seller a reduction from the agreed-upon price of one hundredth of a cent per pound for each hundredth of a Micronaire unit; one hundredth of a cent for each 100 pounds per square inch that the fiber strength falls below the specified average; and three hundredths of a cent for each one per cent by which the amount of short fiber exceeds the specified percentage.

4. By agreement between buyer and seller, other rates of price adjustment than those stated in *Rule 3* may be made part of the contract, and shall supersede those given in *Rule 3*.

5. If the buyer demands price adjustments, the seller may, at his option, take back the entire shipment or any part of it and replace it with cotton that fully meets the specifications, but this option expires on the date set for final completion of the contract, unless an extension of time is granted by the buyer.

6. The buyer may, at his option, accept or reject any bale that differs from the specifications by more than the amounts stated in *Rule 2*. If the buyer accepts such bales, he is not entitled to any additional price concessions because all bales accepted are covered by the price adjustments in *Rules 3* and *4*.

7. In case of disagreement between the buyer and seller as to fiber properties of one or more bales, or average fiber properties of a shipment, samples of the bales in question or the entire shipment shall be submitted for arbitration to an independent fiber testing laboratory agreed upon in the contract of sale. If no such laboratory is named in the contract, samples may be submitted to the U. S. Department of Agriculture or U. S. Testing Company. The loser of the arbitration is to pay the entire cost of such testing, or if the difference is divided between buyer and seller, each is to pay his share in proportion to the amount by which his claims differed from the average values finally determined by the referee laboratory.

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KNITTING SECTION

Too many missed picks?

Here's an easy way to greatly reduce them on SCP and SCOP machines

by E. H. McGrew
Exclusive

MISSED PICKS due to faulty operation of widening picks on Banner SCP and SCOP knitting machines can be greatly reduced by a simple alteration made on the widening pick bracket. This alteration consists of merely positioning the widening pick securing screw in a different place on the bracket.

Widening picks, as well as narrowing picks, on any knitting machine requiring the same will give a considerable amount of trouble and cause a measure of substandard production. Machines which do not use these parts in their operation afford hosiery salesmen with a good selling point that they certainly utilize.

Widening pick trouble on the SCP and SCOP is a favorite topic for discussion with fixers who operate these machines. It seems that these picks will work wonderfully if they are set a certain way. However, the tolerance of this setting is so critical that a slight movement in any direction is an invitation to trouble and frequently to very costly trouble. This trouble stems from the following situations and conditions:

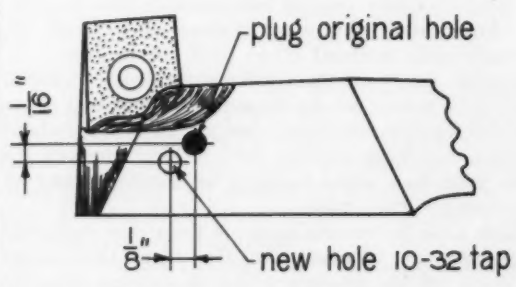
(1) Bracket knocked away from cylinder will not let picks lower needles low enough

(2) Bracket knocked away from cylinder will cause repicks on narrowing side

(3) It is impossible to set picks high enough to operate without bending either the pick, slanting the bracket, bending the widening pick shank throw-out rod, or pick operating lever

(4) The pick rubs cylinder due

(Continued on page 184)



WIDENING PICK BRACKET (FRONT)

FIG. 1

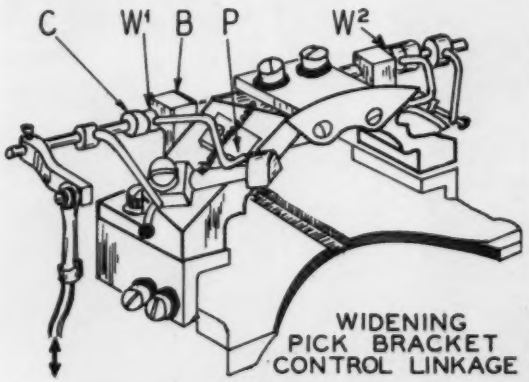


FIG. 2

Adjusting to Double F-F Knitting

by William D. Frye—Exclusive

With two machines to operate, the knitter is less prone to pressure the fixer to get a broken-down machine repaired. Thus the repairs are usually more carefully made, and both parties profit.

Skillful use of needle pliers can often spell the difference between a trouble-free machine and one that is producing menders.

Twice each week a test set from each knitting machine is checked on a flat form for length. If the length is off the standard, the machine is adjusted immediately to produce correct length.

DOUBLE JOBS in full-fashioned knitting is the accepted practice at this time. The arrangement is likely to be permanent—profits at present will not allow a return to single jobs for the knitter.

Some mills absorb the "displaced" knitters, but, while others do not, the number of unemployed ones seems no greater than before. In fact, it appears that if the industry were to expand, young employees will have to be trained as knitters. Knitting is becoming more and more a young man's job, anyway...

Knitters. It seems remarkable that a man can find the time to run two machines. It seems even more remarkable that he can double his production. But both are happening.

Of course, in the one-machine days, the knitter spent a great amount of time oiling and wiping. But, owing in part to the methods used to run the yarn, the machines now require less cleaning than formerly. And usually the oiling is done by someone (or through some method) other than the knitter.

Another way to explain this production is to watch the way a knitter works out a system that will allow him to keep both machines running. This comes about through his own efforts, by watching the way the other man goes about running his machines and by adopting a suitable way.

Each time he reports to work there are eight full hours of work awaiting him. He has no time to get his mind off his machinery and this makes him less prone to make mistakes. I think this is a very good reason why his production is high.

Firms just entering the two-machine picture will find there will be a slight increase in the number of menders turned in with the good work. But this can be taken care of by a system of checking for bad

With knitters busy tending a pair of machines, they have little time for cleaning and oiling, so much of the oiling is done on weekends or when the machines are idle during normal work week.

work. This can be done in the inspecting department where numbered sets are rushed through so that any menders can be remedied immediately at the knitting machine. This system does not reduce the knitters responsibility in keeping menders to a minimum. It is only an aid.

Fixers. One of the fixer's most important jobs is seeing that the machines are in good running condition—easy to say, sometimes hard to do, but it must be done. To effect this, a fixer must stick with the machinery his full shift and work closely with the knitter on his problems. If he does this, he won't need a daily or weekly report to tell him the quantity or quality of the work being made—he will know at all times.

The mental attitude of the knitter toward his job. is important in keeping his production up. The fixer is working closely with the knitter anyway so he is in a position to help along this line.

The Team. Each piece rate operative will produce at a high rate if he possibly can. Most knitters will cooperate with the other two shifts on his pair of machines. They will work with one another when it comes to keeping end needles in, working on menders or keeping ends cut away from the hand wheel shaft and take-up roller shaft.

But there is always one who will sometimes cheat a little on the other two. Taking the "other man's" word for such is bad, because he will see things in a different light than someone who knows both sides of the story—everyone feels like he is pulling a little larger share of the load (including the one who actually lets down a little).

A little prodding here is usually all that is necessary. If the knitter is lax the fixer must correct this by seeing that he keeps his needles, points, and sinkers aligned and his knitting up to standard. But, and this is important, the knitter should feel free to call the fixer when he has machine trouble that he cannot correct himself.

Sometimes a fixer will gripe each time a knitter comes to him for help, either from fear of being overloaded or with the idea of getting out of work almost altogether. This resistance can demoralize the knitter who will finally quit asking for help except in an extreme emergency. He will let the little things go until they finally peck away at his pay check.

This situation is bad for all the other people working in the plant. Now that all jobs are doubled up, each person must do his job well or he will burden someone else who already has a full load.

There does not seem to be very much more fixing now on double jobs than there was on single jobs. This may be due to there being only half as many

One approach to quality control has a numbered set seamed from each machine daily and tight or loose sides marked on a form. A selvage length tester is then used before machine is adjusted.

Usually on the day the stockings are knit, flaws in the numbered test set are recorded and the report sent back to knitting room.

knitters—one-half as many fussy knitters and half as many mistake-laden knitters. Nevertheless, when the fixer has a job to do he is not pressed for time now as much so as before. The knitter can run one machine while the other is being repaired. There is no hurry-up so the knitter can get to work. Thus, a better, more thorough fixing job.

Missed picks *(from page 181)*

to critical setting required to operate through enough arc to lower needles to proper level

(5) Sizing operation on machines will sometimes throw adjustment of picks out of optimum operation

All of the foregoing troubles are caused or aggravated by the location of the pivotal point of the widening pick on the widening pick bracket. The standard location is too high and wide in relation to the cylinder if greater efficiency and more setting tolerance is desired. The standard setting releases the needle too soon in its downward travel, and correction requires a longer arc of travel to a lower horizontal level on the cylinder.

To achieve this correction:

(1) Remove the necessary parts to expose and permit removal of the widening pick bracket.

(2) Remove the guard cam bracket from bracket, also picks, stop plates, brads, and screws (this should leave the bracket with nothing attached).

(3) Screw a soft No. 10-32 screw into the original pick securing screw hole, cut and file this screw flush as shown in *Fig. 1.* [see box

Per capita use of women's hose highest since 1950

■ WOMEN'S hosiery manufacturers are able to claim for 1959 the highest per capita consumption figure since 1950—a total of 12.07 pairs of stockings and anklets for every woman in the U. S. aged 15 and over, W. F. Williamson, president of the National Association of Hosiery Manufacturers, pointed out in the foreword to the recently published "Hosiery Statistics—1959."

The men's total of 10.5 pairs was the highest in three years, Mr. Williamson continued, and the boys', children's, and infants' total of 6.0 pairs exceeded all figures since 1953.

Total hosiery industry sales in 1959, represented by shipments, advanced 4.8 per cent over those of 1958. Every major division of the industry, except full-fashioned stockings, reflected an increase, Mr. Williamson said. Women's full-and knee-length hosiery shipments gained 4.7 per cent as a 7.5 per cent decrease in full-fashioned was more than compensated by a 23.7 per cent rise in seamless. A 2.7 per cent increase in men's hosiery types was shared by all divisions in the category; likewise, every division in the children's and infants' category contributed an overall advance of 7.7 per cent for the group.

The amount of hosiery produced in the southern states again showed an increase in this, the Association's twenty-sixth annual statistical report —87.4 per cent of the total, compared with 85.1 per cent in 1958. But North Carolina's 1958 position as producer of half the hosiery in the country suffered slightly (from 50.1 per cent in 1958 to 48.5 per cent last year) as Tennessee, particularly, and other southern states as well, advanced their relative positions.

At the end of 1959 there were 1,050 hosiery plants in the U. S., 414 of which were classified as full-fashioned and the remainder seamless. The 1958 figures were: total number of plants, 1058; full-fashioned, 453; seamless, 605.

The monthly average number of employees in women's full-fashioned hosiery mills during 1959 was reported to be 33,525, a decrease of 1,812 or 5.1 per cent from 1958. Monthly average number of seamless employees (women's plus all others) was 72,665 in 1959 as compared to 67,182 in 1958 (an 8.2 per cent increase).

Women's full-fashioned production was 9.1 per cent less in 1959 than it was in 1958 while employment was only off 5.1 per cent. Total seamless production (women's and all other) increased 9.8 per cent while seamless employment gained 8.2 per cent.

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Modern Slitting and Shearing Equipment

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87-G RINDGE AVE. EXTENSION
CAMBRIDGE 40, MASS.

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UNIVERSITY 4-2460

at bottom of page 181].

(4) Repeat this operation in rear pick hole also.

(5) Now locate a point 1/8" down and 1/16" in from the center of the original hole, which was just plugged. Center-punch this point preparatory for drilling.

(6) Note that the face milled onto the pick bracket is a compound angle, and, therefore, great care must be exercised to obtain a new hole which is perpendicular to that face vertically and horizontally—to do this, level the face to zero in all directions, and not the bracket.

(7) Drill a No. 21 hole and tap a No. 10-32 thread into the leveled piece at punch marks ½" deep.

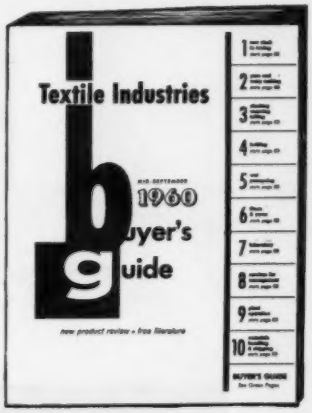
(8) Reassemble onto machine with picks in new hole.

(9) Lowering these picks will invariably position the pick shank throw out rods too far behind the widening pick shank. This is easily eliminated by adding washers W, *Fig. 2*, between the shank collars C, *Fig. 2*, and the shaft bracket B, *Fig. 2*. This also affords a better bearing support and surface.

(10) Position the stop plates P, *Fig. 2*, in a horizontal instead of a vertical plane and adjust them for the height extremity desired for their related pick.

This simple correction should allow a working tolerance from a maximum setting away from the cylinder of the widening pick bracket to a minimum setting. In other words, if properly done, the picks should work correctly regardless of the setting of the bracket so long as it is rigidly secured to the cam plate.

COMING LATER THIS MONTH



4-in-1 bonus issue for subscribers

- ► Equipment review
- ► Available literature
- ► Sources of equipment and supplies
- ► Advertising of suppliers

Recent developments *(from page 93)*

Magnetic Spinning Ring. A Japanese firm has developed a magnetic spinning ring, said to revolve at 25,000 to 30,000 rpm, eliminating the traveler.

Heavy-Duty Draw Twist Unit. A German-made heavy-duty draw twister, now under evaluation by several American nylon yarn producers, is designed primarily for 500-2,000-denier yarns. The machine combines hot and cold drawing stages and is said to give a low breaking tension. Output of each drawing head is over 200 yards per minute on 1000-denier yarn.

Smoothening Selected Spun Yarns. A recent British patent discloses a method for making smooth yarns spun from staple fibers of polyamides, polyesters, or polyvinyl compounds by passing them over surfaces which are heated above the congealing temperature but below the melting point of the synthetics.

Composite Yarn. Patented by an American yarn processor is a three-ply yarn in which one component is not shrunk, while the other two have different degrees of shrinkage.

Producing a Cored Yarn. An invention of the British Rayon Research Association is a method for the production of a seven-ply cored yarn on conventional ring doubling machinery. The yarn is comprised of six ends of a 7s fiber and one of 840-denier filament nylon, the latter automatically taking up a central position in the yarn although all are fed in at the same rate.

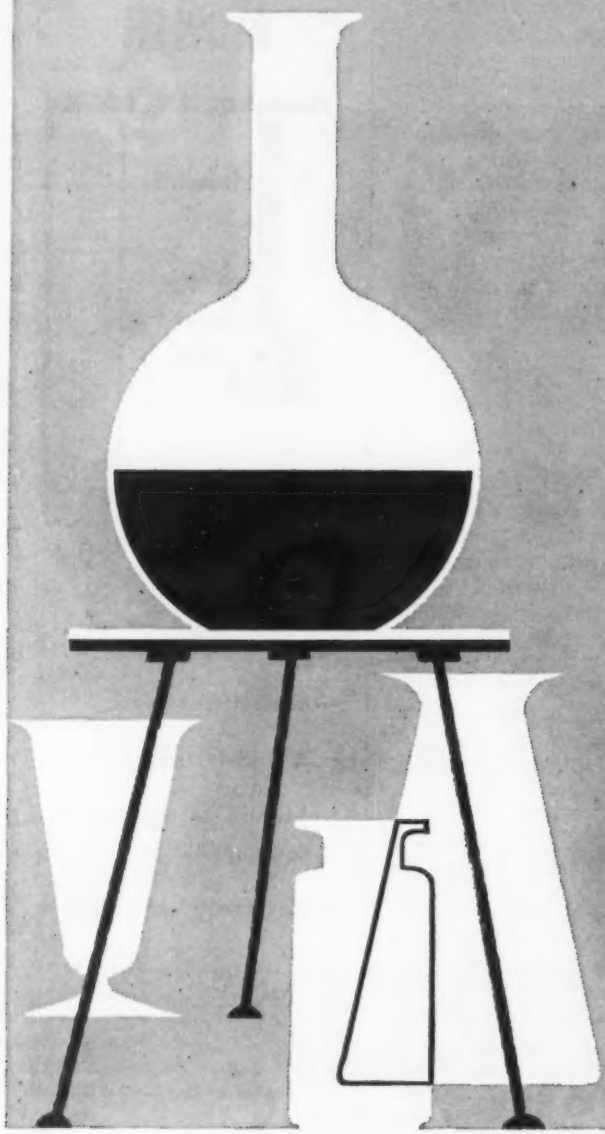
Circular Loom. A newly designed circular loom is claimed by its Belgian inventor to be capable of weaving yarns of most fibers into cloth of fine to heavy constructions in most common designs. Several widths of normal size can be woven together, then separated as they come from the loom. During weaving, a strong leno selvage is introduced. One weaver can look after four to six looms. First model will be produced in England by early 1961.

Direct-Spun Nylon Yarns. It has been reported that a foreign machine to convert 100,000-denier nylon (1 1/2 dpf) tow to sliver produces a level sliver with fibers having a fairly uniform distribution length within the range of 1 1/2"-2". The fibers are said to have a higher tenacity and lower elongation at the break than the filaments in the original tow, their cross-sections changed at the same time to a noncircular form.

Crimping Synthetic Filaments. A New Jersey research organization has devised an apparatus for crimping strands of synthetic polymerizable substances by introducing a vibrating motion to the yarn in a heated chamber.

Glytex CMC

by KEEVER



New Glytex CMC is a water soluble warp size for the textile industry. Because of its precise formulation and carefully controlled production, Glytex gives you these specific advantages:

- — produces a smoother, more mellow hand for cotton, synthetics and blends.
- — provides better weaving efficiency even under lower weave room humidities.
- — forms a uniform non-congealing solution.
- — provides a cleaner operation and easier equipment clean-up.
- — resists bacterial breakdown, cutting B.O.D. to a minimum and reducing stream pollution.
- — may be used in smaller amounts, reducing operating costs and giving more warp mileage.
- — is soluble in warm water and can be desized without enzymes or other chemicals.

The Keever sales-service man is available at any time for technical assistance on the uses of Glytex. His cooperation in conducting thorough Glytex testing programs in your plant can be invaluable.

Explore the possibilities of improving your operations with Keever's new Glytex CMC.

For more information about Glytex CMC write for data sheet 2000.

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HOW OTHERS MANAGE

Proposes dyeing spooler cores various colors

► *This discussion began in the June 1960 issue, page 157, with a request by Contributor No. 1240. He asked for ideas on color coding spooler starters.—The Editors.*

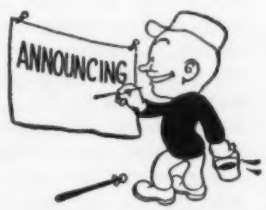
THE EDITORS:

CONTRIBUTOR No. 1240 might use our trick of notching the bakelite spooler cores or starters inside the rim on the outer end and painting the notches with bobbin enamel. When the yarn is to be changed, necessitating a color change, the old enamel is removed with a rotary wire brush. We cut the notches with a small emery wheel.

CONTRIBUTOR No. 1252

THE EDITORS:

Should the starter core be one of the following plastics we can dye it to a deep shade: acetal, acrylonitrile butadiene styrene copolymers, acrylic, cellulose acetate, cellulose acetate butyrate, casein, phenolic cast resin, polyes-



A Brand New Contest

Win $100

Get Busy Now – Win $100

Every kink, short-cut, time-saver, or quality improvement suggestion entered in the contest will be paid for immediately upon acceptance, and the $100 award will be made to the winner as soon as all entries are judged.

The contest rules are simple:

► All contributions must be postmarked not later than midnight, December 15, 1960.

► No limit to the number of entries an individual may submit in any one contest.

► All entries paid for upon acceptance—no waiting. Extra payment for photographs that are usable. Extra consideration is also given kinks accompanied by legible pencil sketches or drawings.

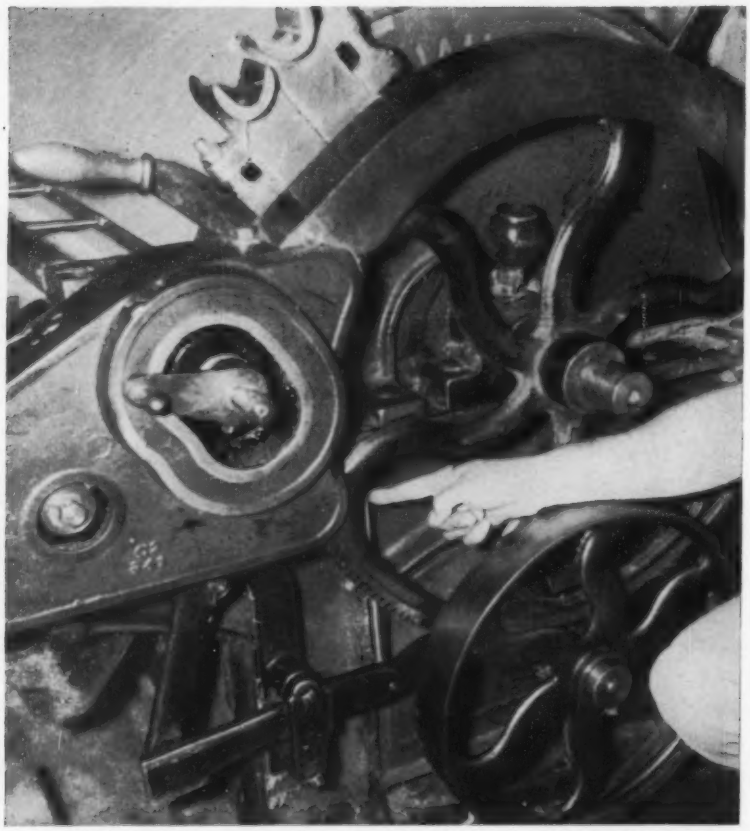
► Entries must not have been published previously and must not be submitted to any other publication.

Send your contest entry to: The Editors, TEXTILE INDUSTRIES, 806 Peachtree St., N. E., Atlanta 8, Georgia.

ter cast resin, nylon, polycarbonate, polymethylstyrene, and vinyl. We are able to tint such plastics as melamine, high-density polyethylene, polypropylene, polystyrene, and urea formaldehyde. If the core is of brown bakelite, we can tint it as many ways as the original color will permit.

COLORITE INDUSTRIAL DYERS

"Shock absorber" aids card uniformity



The eyebolt (finger) that supports the spring and in turn the arm carrying the production gear is passed through a hole in the card frame flange. A simple cap screw secures the spring to the gear arm, while a "reversed" on-off slide allows the spring to lift the arm and its production gear to the doffer gear. The spring compensates for gear vibrations that would normally be transmitted to the doffer to affect sliver uniformity.

THE EDITORS:

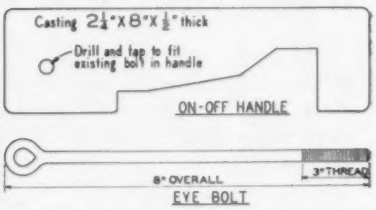
After six months of trial, a "shock absorber" was scheduled for installation on all Model H Whitin Cards at Caldwell Cotton Mills, Hudson, N. C.

On Model H cards, the production gear bounces on the doffer gear as a result of irregularities in the gears. This condition produces mechanical defects which the Spectrograph shows up as thick and thin places in the card sliver.

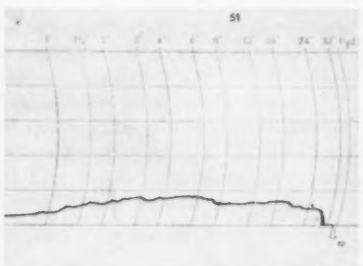
The "shock absorber" was made of an eye bolt fastened to the card frame and with a spring attached to support the side arm which carries the pulley and gear (see illustrations) driving the doffer gear. The arrangement suspends the side arm in a nonrigid way and permits the pulley gear to adjust to gear imperfections instead of transmitting the shock to the doffer gear and subsequently to the card web and sliver.

A 7" eye bolt of ¼" diameter is fastened to the card frame, as shown, through a 5/16" hole. 2½" of the eye bolt provide sufficient threads for adjustment to any tension needed. Two nuts and washers secure the setting.

A knockoff spring from a Foster winder (part No. 259 K) is fastened onto bottom of the eye bolt. A 3/8" cap screw through the production arm permits fastening the spring.



Outline of the new on-off slide, eyebolt.



Spectrograph chart of sliver produced on card fitted with doffer gear containing 15 welded teeth and a production gear with a missing tooth showing evening effects of the "shock absorber."

The doffer on-off slide (see illustrations) has to be made to go with this arrangement but the change is simple, as shown. The change lowered integrator readings from 3.5 to 3.0, a half point improvement. No more thick and thin places have shown up in sliver that were attributable to side gears.

The parts cost less than a dollar per card for the change, and the spring prevents further tooth breakage, a frequent occurrence otherwise. The change has already been made on 125 cards at this mill, and others are scheduled for the change as quickly as possible.

CONTRIBUTOR No. 1253

Consolidate group insurance-hospitalization records

THE EDITORS:

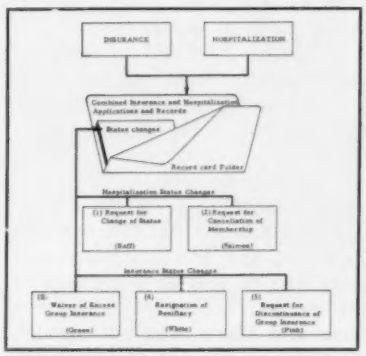
One of the most proven examples of consolidation of records in textile system designs is the problem connected with group insurance and hospitalization plans, which so many textile mills make available to their employees.

A common procedure is to keep two separate major files, one for group insurance and another for hospitalization. The records for each require status changes (normally five are necessary) and the needed auxiliary records are usually printed on differently colored cards for quick identification, and filed separately.

To remedy this situation the procedure has been modified by some textile mills so that the status-change record cards are filed with the major records. Still further consolidation is possible.

This is accomplished by developing an over-all plan permitting a systematic consolidation of all the records by treating the record problem of each individual as a complete unit. The consolidation as shown in *Figure* 1 requires combinations of records as well as of files.

The application and recapitulation records of both group insurance and hospitalization are combined on one card 8″ wide by 9¼″ high, which becomes a folder record fitting an 8″ x 5″ vertical card file. This record is filed in numerical order by the employee's clock number, disregarding departments, or as an alternative, is filed strictly alphabetically by mills (in group mill plans) to give positive and accurate identification.



The five status change records, each of a distinctive color, are printed on 16-pound bond. The colors readily identify the type of status change.

CONTRIBUTOR NO. 1245

Need Money?

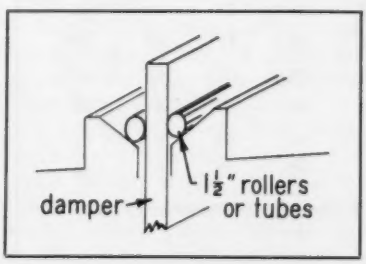
Send TI your kinks, short cuts, etc. (the rules are on p. 187)

Sliding damper controls hot gases

THE EDITORS:

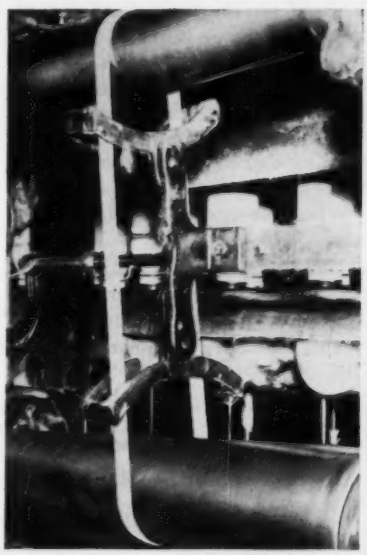
There are a number of pieces of equipment in a textile mill in which sliding dampers are used. If the dampers are used in controlling hot gases in the flues of a boiler, for example, it is very difficult to insure that there is not a serious leakage of air through the gap between the damper and its housing. The accompanying sketch illustrates one method which we have found very successful for this purpose on a battery of Lancashire boilers.

The damper is built up with a hard concrete layer, to give a "V"-shaped gap through which the damper moves. Lengths of 1½″ diameter steam piping are then cut to be a loose fit in the width of the trough. These rest on the damper blade and very effectively prevent air from leaking into the flues without causing any restriction on the movement of the blade. This device can be very easily fabricated by unskilled labor, and the length of piping will be found in the scrap box of any mechanic's shop.



CONTRIBUTOR NO. 1211

Special cone belts improve roving frame performance, mill finds



EXTREMULTUS, INC.

At the Berkshire Hathaway, Inc., mill in New Bedford, Massachusetts, a team of engineers checked belt performance on 25 roving frames. The pulleys graduate from 5 5/8″ in diameter at 1160 rpm, up

to 16" in diameter at 372 rpm.

On each check since installing the belts, a combination of chrome-tanned leather and a polymer plastic core, the drive speeds have been maintained. There has been no downtime for belt maintenance since the installation. The belting formerly used required frequent take-ups.

How important is uniform humidity in laboratory?

THE EDITORS:

Cotton mills having physical testing laboratories that do not have complete atmospheric control, but depend solely on humidifiers to keep their moisture content close to standard, sometimes find diverse humidity readings at different places in the department. How do these variations affect the testings? Are the test results reliable?

One testing laboratory decided to take sling psychrometer readings at different spots of the room twice a day for several days to ascertain the variations existent and to note the divergence, if any, from the standard which was 60%. There were three humidifiers in this lab, with a humidity-recording clock centrally located in the room.

The results of the test are shown in Table 1. It will be noted that one of the three humidifiers went out of commission sometime Wednesday. It was repaired by the machine shop workers late in the day. The humidifiers were kept running day and night, seven days a week.

When the one humidifier ceased functioning, arrangements were made to test only those items which had been in the room long enough at standard humidity so that no doubt would ensue after the tests were completed. This precaution appeared successful since no sufficient difference was found that would have given concern about the test results.

It was also decided to continue the readings during the period of the breakdown of the one humidifier to note how the readings compared at the different locations. At the same time comparative testings were to be made, sizings and lea strengths (on cotton single yarn) at the low humidity and then later on the same material at the normal humidity. This was done and there was not enough practical change to warrant rejection of the tests made at the lower moisture content.

Looking at the tabulation, it will be seen that there is some variation at the different spots in the room, and that this variation held true for the period that the one humidifier had ceased running.

Take the first daily readings on Tuesday afternoon, for example. Practically no difference exists except at the center of the room. What caused this greater concentration at this point? On Thursday morning all points checked were equal, whereas, in the afternoon of the same day, there was a greater concentration at the north corner. Possibly, the reason for these variations could be discovered by a bit of research work.

However, for all practical purposes, there was no change in the testings of the material from each of the locations checked. From the foregoing comments it may be assumed that no adverse results occur to the tests when there are small differences in humidity at different spots in the laboratory.

CONTRIBUTOR No. 1156

TABLE 1

July Humidity Readings Taken at Several Points in Testing Laboratory

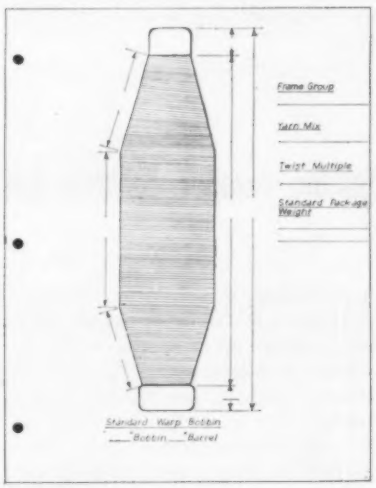
Day of week	Time of day	Central hygrometer reading	Relative Humidity Taken by Sling Psychrometer			
			North corner	West corner	Center of room	East corner
Tuesday	3:00 p.m.	60	61	61	64	60
Wednesday	10:00 a.m.	60	60	61	60	60
Wednesday	3:00 p.m.*	49	44	47	44	38*
Thursday	10:00 a.m.	61	63	63	63	63
Thursday	3:00 p.m.	59	60	57	57	57
Friday	10:00 a.m.	60	64	64	61	61
Friday	3:00 p.m.	60	62	65	62	58

*One humidifier was out of order. Standard for laboratory was 60 per cent

Package weight blueprinted

THE EDITORS:

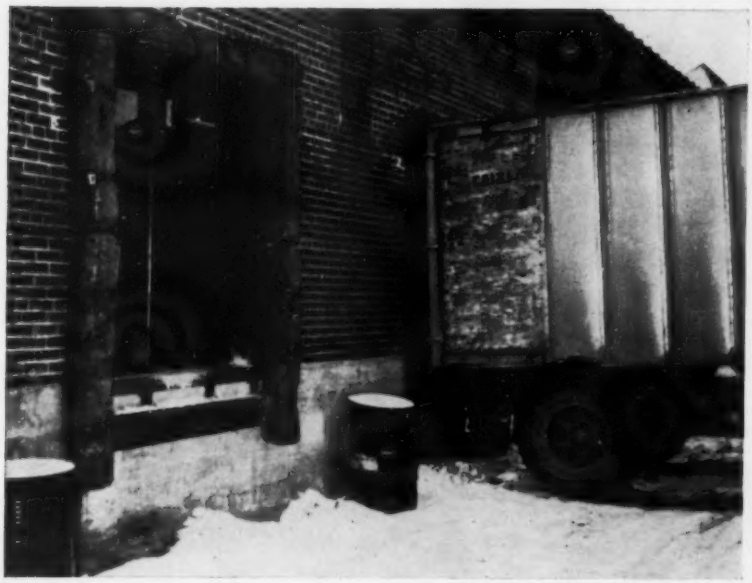
We use these forms containing the warp bobbin sketches in maintaining build and package weights. For each package size we establish dimensions that we enter in the spaces provided. Other information that may be important in



determining package weights, such as the twist multiple, is likewise entered in the appropriate spots. With such "blueprints" for package weights and builds on hand, the overseer or second hand finds keeping bobbin weights up to standard a much easier task.

CONTRIBUTOR No. 1254

Door gaskets that can take the bruising



Loading-dock bolsters, called Door Gaskets, act as an air seal between the back of a truck and the warehouse loading door, keeping out cold, wind, rain, and dust and protecting both truck and building from damage as well. In effect they are tubular sausages, of 16-oz neoprene-coated nylon stuffed with shredded polyfoam, that are strong enough to resist the constant abrasion and flexing from trucks. They are weatherproof as well.

Made with sewed seams, and with grommets to allow them to breathe, they are installed on the doorway with 1½" web straps and buckles sewed to the bumper and are secured to the building with footman's loops. The first units installed have been in service more than a year, have needed no repairs, and do not show significant signs of wear.

REEVES BROTHERS, INC.

More on printing aniline black—formulas

THE EDITORS:

Over a period of many years, during which time the writer was manager of two large printworks, we confined all aniline black printings to nitrate of aniline to the exclusion of aniline salt, except in the case of so-called "silver greys"—stipple covers resisted by alkalies — for which prussiate black with aniline salt was used for the sake of low costs on cheap lines. The nitrate black, which we called L Black, was used on pegs, lines, blotches, etc., as single colors or multicolors with vats, alizarines, etc.

L Black was an excellent working color in the machine, producing a bloomy shade free from the pink tinge characteristic of some other aniline blacks. When the goods stopped on the dry cans the formation of rosaniline was distinctly less than that produced by prussiate black using aniline salt. Seldom was there any corrosive effect on the doctor blades and tendering was at a minimum.

When the color combination called for steam colors, such as alizarines and basics, the black withstood long continuous steaming well, but when long steaming was not required, a simple vat aging was sufficient to produce the bloomy shade. When the blotches were so heavy that excessive tendering might occur, gassing in ammonia after aging was done. Soaping was then carried out as usual, and permanganating and clearing with bisulfite and oxalic and sulfuric acids cleared the whites and removed any fine scratches.

While the cost of aniline nitrate black was higher than that of aniline salt blacks, reduction of printing machine troubles and seconds, and better shades resulted in our adoption of L Black as a standard color for all styles except the cheap lines of silver greys. The method of making up the print paste was:

Prussiate-chlorate standard solution

87½ lb yellow prussiate of soda
43¾ lb chlorate of soda
50 gal water

Dissolve, decant and strain into barrel—total bulk 56½ gal.

Black standard (in kettle)

40 gal prussiate-chlorate solution (above)
75 lb corn starch
20 lb tapioca flour
½ lb stearic acid

Fill to 60 gallon mark, boil and cool.

Print color

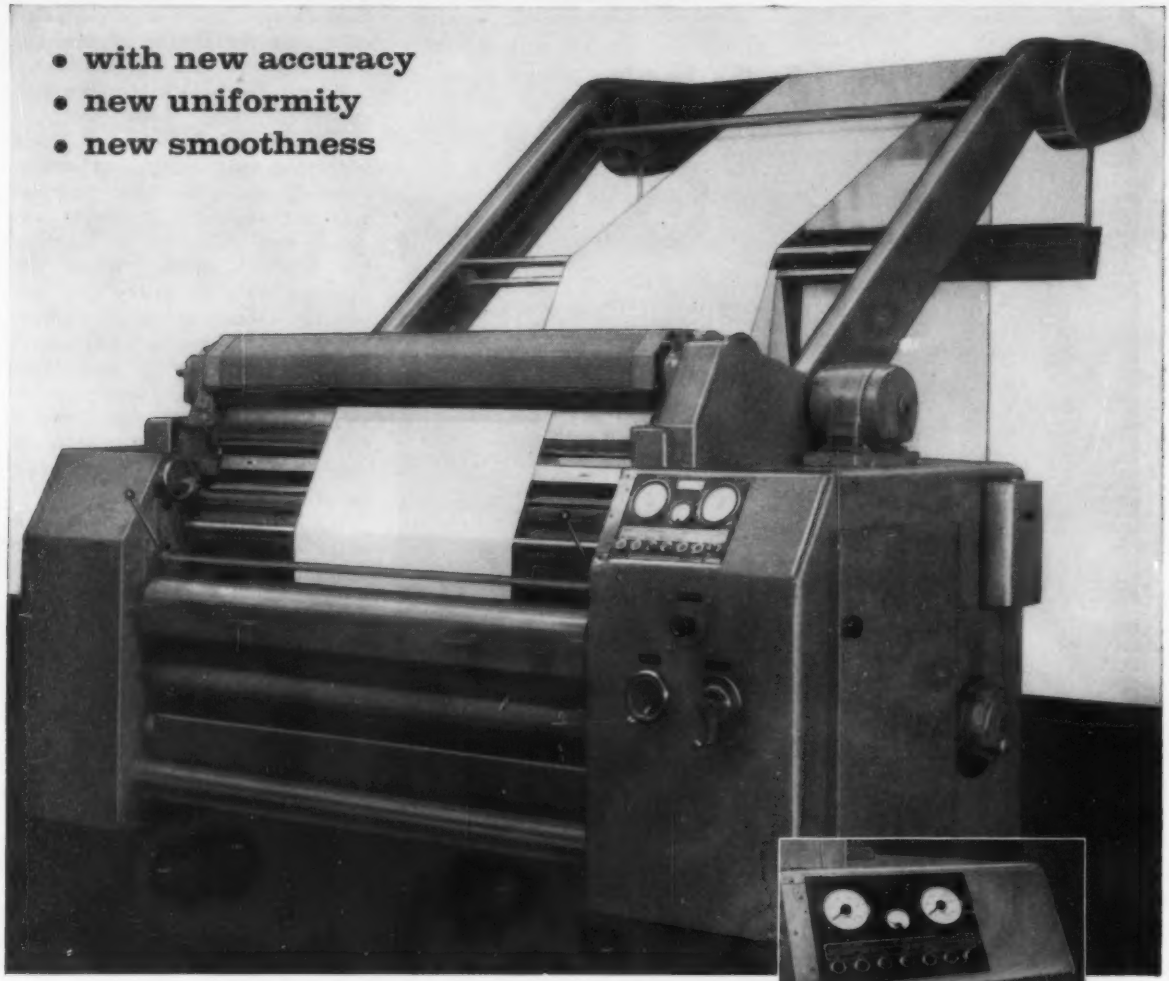
19½ gal black standard (above)
3¾ gal aniline oil (mix well and stir in)
22½ pints acetic acid 56° Tw (add gradually with stirring)
22½ lb nitric acid 60° Tw (or 16 lb—14 oz at 80° Tw)

As a rule this print color was reduced 3/1 (3 parts above print color to 1 part starch paste) or 5/1, depending on the engraving and depth of shade required.

CONTRIBUTOR NO. 1258

THE FRANKLIN SHEAR-

- with new accuracy
- new uniformity
- new smoothness



Put a whole new face on woolens, worsteds, synthetics, knitgoods and high pile fabrics with this new Gessner finishing Machine.

Revolver and knife, anchored to the main frame, reduce vibration and chatter, to produce a remarkably accurate and even cut — every inch of it uniform and smooth. We hope you will want to know more about the Franklin Shear.

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NEW PRODUCT PARADE

Please note: Claims made in all of these announcements of new developments are of necessity based upon information furnished by the respective suppliers.—The Editors.

High production curer improves fabric quality

Quality of finished fabrics is improved when the "Proctor Continuous Rotary Polymerizer" is used for the curing of finishes, because the curing takes place at the least critical conditions—at lower temperatures for longer times. Production rates are high, and seconds are reduced.

The compact machine uses a unique combination of conduction and convection heating and a novel reel-like arrangement for cloth travel and retention of from 40 to 880 yards. Cloth is stored at full width, with minimum contact with guides, and with absolute freedom from marks and wrinkles.

Proctor & Schwartz, Inc., 7th St. & Tabor Rd., Philadelphia 20, Pa.

Do you want more data? Write ◆ or use card on page 207; list J-101

Controls moisture on high-speed slashers, ranges

The new "Moist-O-Graph IV" moisture control system, for measuring and controlling the warp regain at the slasher or the moisture content of fabrics in continuous range processes, offers the following advantages:

1. It works efficiently on high-speed processing equipment.

2. It can accurately measure and control a greater range of moisture content.

3. This is not a fixed system—it can use any standard Honeywell control unit and the transmitter can feed into any "ElectroniK" recorder or an "ElectriK Tel-O-Set."

4. It is flexible—the recorder can either be mounted with the transmitter near the point of measurement or in some remote location such as a superintendent's office.

The new system consists of a primary sensing element, the "Moist-O-Graph" transmitter, and a recorder, with the option of a suitable automatic control mechanism. The sensing element (a detector roll) contacts the material moving in a process. Passing from this sensing element through the material to an electrical ground is a small electric current which varies as the electrical resistance of the moving material varies. Since the amount of electrical resistance is determined by the amount of moisture present, an inferential measurement is continually being taken. The transmitter sends these measurements in the form of a 0-10 millivolt signal to an instrument which indicates or records them in terms of moisture content. If control is included, a control signal is transmitted from the recorder to the final control element, to keep the moisture within specified tolerances.

Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.

Do you want more data? Write ◆ or use card on page 207; list J-102

Lint-tight loom switch is reliable, lasts longer

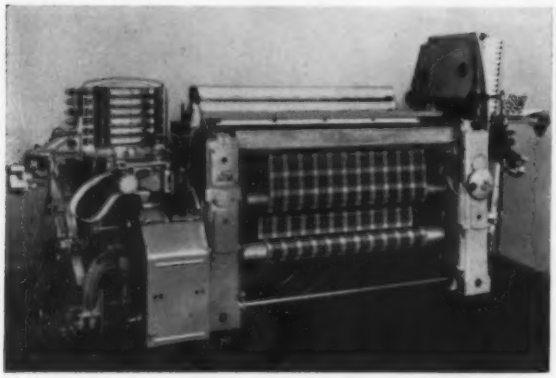
A new lint-tight manual motor control is designed to start and provide overload protection for a-c and d-c motors maximum rated at 5 hp, single phase, 440-550 volts a-c, and 7½ hp, polyphase 440-550 volts a-c, and 2 hp, 230 volts d-c.

Compact enclosures are sealed against entry of lint contaminants by closed cell rubber gasketing. Mounting may be either wall or pedestal. The latter includes conduit entry. Thermal overload protection, which includes trip-free operation, is provided. If the overload relays act to open starter contacts, they cannot be closed until the relays have been reset.

A unique operating principle offers high reliability and lengthens service life. Operation of a rotary type handle releases spring loaded movable contacts, allowing them to close and bridge the stationary contacts. Constant contact pressure is assured by the springs.

Allis-Chalmers Mfg. Co., Industries Group, Box 512, Milwaukee 1, Wis.

Do you want more data? Write ◆ or use card on page 207; list J-103



Six filling colors from this automatic loom

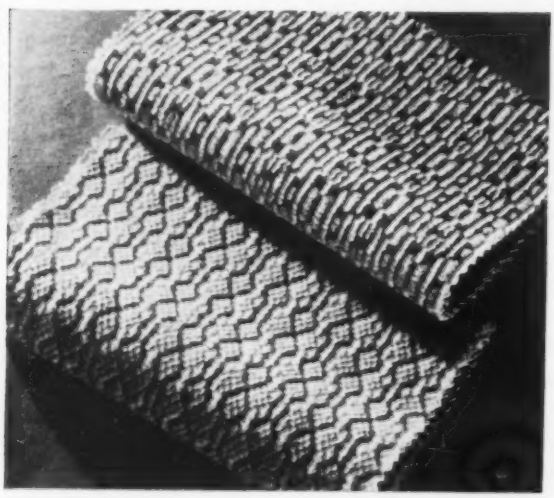
The fully automatic 6 x 1 box loom built by Adolph Saurer, Ltd., Switzerland, presents designers a wide range of color and yarn possibilities at automatic-loom economies. The unit is supplied with a six-color vertical magazine that can hold up to 92 pirns.

Saentis, Inc., 2911 Summit Ave., Union City, N. J.

Do you want more data? Write ◂ or use card on page 207; list J-104

New fibers and yarns

Upholstery nylon for frieze fabrics. A new textured continuous filament nylon yarn provides more versatility in styling of frieze fabrics. Called "Antron" 24 nylon, it is a distinctive type of the "Antron" multifila-



ment tri-lobal nylon recently introduced. In addition to having nylons well-known features of abrasion resistance, durability, and ease of care, this new yarn contributes greater covering power and dye depths and attractive texture and luxurious hand to fabrics made from it. Current production is in 1300 denier.

Textile Fibers Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Do you want more data? Write supplier or use card on page 207; list J-201

Fortrel polyester staple fiber and tow are now commercially available. Applications visualized for this strong, dimensionally stable, durable, and very resilient fiber which blends well with others are men's, women's, and children's apparel, and industrial uses.

Celanese Corp. of America, 180 Madison Ave., New York 16, N. Y.

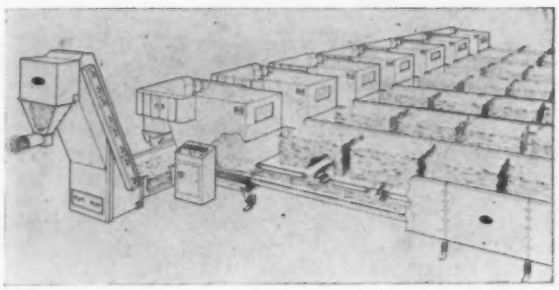
Do you want more data? Write supplier or use card on page 207; list J-202

For use with cotton in yarns for skin-contact apparel fabrics is "Orlon" Type 72 staple which is the result of development work to meet a growing need for a high-performance staple of outstanding comfort rating for sport shirts, underwear, and other next-to-skin apparel. A key feature of the 1.5 denier, 1½" staple for blending with cotton is its exceptional built-in whiteness; only the cotton component of cotton/Orlon Type 72 blends requires bleaching.

Textile Fibers Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Do you want more data? Write supplier or use card on page 207; list J-203

Automated cotton bale blending unit



The Hunter Model AN multi-tuft bale blender complements the Hunter Fiber Meter blending system. It picks predetermined amounts from each bale, brought to it on a conveyor, to effectively preopen the fibers before they are blended and subjected to subsequent processes. Amounts are removed alternately from each bale in a grade, so that the possibility of short-term variations between bales is eliminated. Thus blend accuracy does not depend on "unskilled" opening room personnel.

James Hunter, Inc., 745 Lowndes Hill Rd., Greenville, S. C.

Do you want more data? Write ◂ or use card on page 207; list J-105

Colored nylon travelers discourage mixing

Colored nylon travelers allow for quick, accurate identification and simplify checking for correct traveler weight and shape in the twisting room. The colors are carefully spaced for maximum identification ease, are repeated only in distinctly different sizes or types—237 styles in a range of 16 colors.

It is pointed out that the travelers cannot be dyed and also given the special finishing treatment that gives the longest life and greatest abrasion resistance to the traveler. So, for the time being, it remains a choice between color-coded travelers and some reduction in traveler life. Sales engineering service is offered to help in working out at plant level the most efficient traveler application.

Coats & Clark, Inc., Nylon Traveler Div., 1292-1298 McCarter Hwy., Newark, N. J.

Do you want more data? Write ◂ or use card on page 207; list J-106

Top roll cots stay clean, aprons don't stretch

Use of the recently introduced "Draftex" top roll cots and aprons for spinning and roving frames results in cleaner running, less waste, reduced lapping, and fewer ends down.

The cots, made of buna N synthetic material in sizes up to 2¾" O.D. and for any length of working face, (1) maintain a clean drafting surface by preventing the development of an oily surface film, (2) prevent ends down due to lapping, and (3) resist generation of static electricity. Back roll cots have a filler additive to increase drive. Compounds of varying hardness are available.

The aprons, which are produced to fit most sizes of single- and double-apron drafting systems, are a single homogeneous layer of synthetic rubber reinforced by high strength synthetic fiber cords centrally disposed within the wall thickness, thus preventing stretching in service and yet providing resilience. They have a smooth, satin-like finish designed to give improved fiber control.

Dixon Corp., Textile Div., Bristol, R. I.

Do you want more data? Write ◂ or use card on page 207; list J-107

Automatic jig for dyeing samples

Piece dyeing of samples of fabrics is readily and efficiently accomplished with a Tattersall & Holdsworth's automatic jig which is made of stainless steel and has a capacity of 1 to 6 gallons.

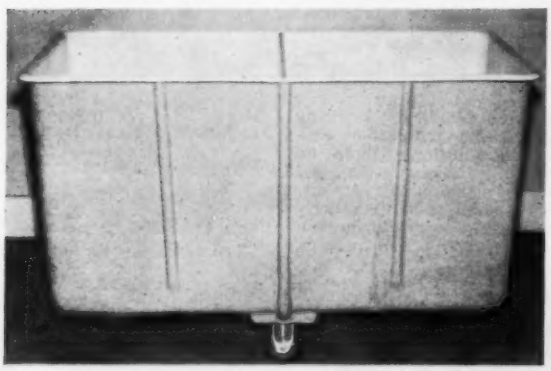
The reversing mechanism of the totally enclosed unit is entirely automatic and can be set for 39 double passages after which the jig stops. The easily cleaned beck is heated by electricity or gas and kept under thermostatic control.

Ernest L. Frankl Associates, 515 Madison Ave., New York 22, N. Y.

Do you want more data? Write ◂ or use card on page 207; list J-108

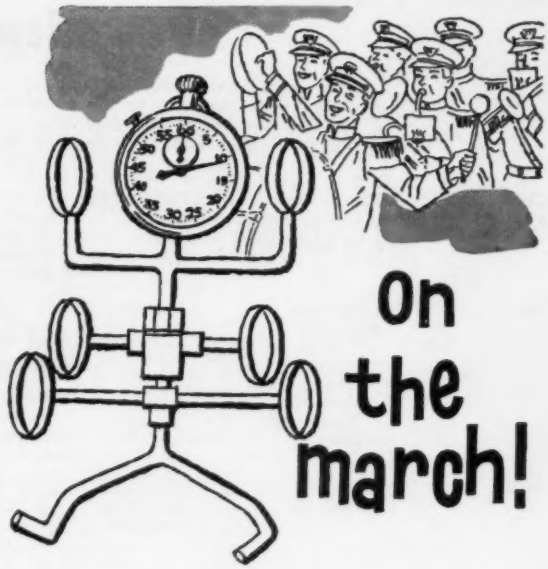
Wet processing liquids don't damage these items

The two-compartment truck box shown here is only one of a complete line of reinforced fiberglass trucks, tanks, vats, tubs, buckets, etc., which have recently been



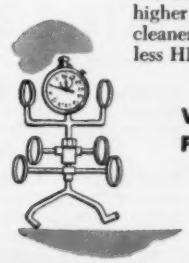
made available to the textile industry. These items are especially suitable for use in wet processing plants as they are resistant to most corrosive gases, fumes, and liquids, including strong solvents, dyes, alkalis, oxidizing agents, and reducing agents; also, their interiors have a

Continued on page 198



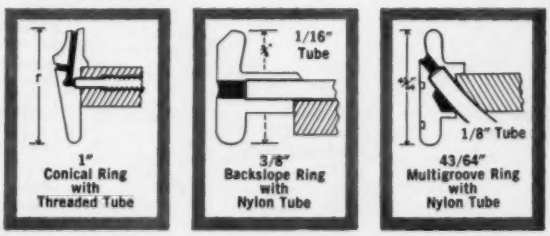
Rings equipped for Centralized Lubrication

There's an accelerating swing . . . to lubrication systems that have demonstrated their ability to deliver as fine as .00010 oz. of lubricant per "shot" per ring . . . with precise timing of pressure pulses. From mills running worsted, wool, carpet yarns, tire cords, glass yarns, come reports of: higher speeds, more uniform tension, cleaner work, longer traveler life . . . and less HP consumed.



WE MAKE RINGS FOR ALL SYSTEMS

★ Alemite
★ Bijur
★ Lincoln



See DIAMOND FINISH Automatic Lubricated Rings at Greenville, Booth 209

WHITINSVILLE (MASS.) SPINNING RING CO.

DIAMOND FINISH

Makers of Spinning and Twister Rings since 1873

Rep. for the Carolinas & Va.: W. K. SHIRLEY, P.O. Box 406, Belmont, N. C.
Rep. for Ala., Ga. & Tenn.: H. L. WILLIAMS, Box 222, West Point, Ga.

New dyes

For more information on one or more of these recently developed dyes, either write directly to the supplier whose name appears in Col. 5, or list the key number in Col. 6 on one of the handy return cards on page 207 and TEXTILE INDUSTRIES *will request the data for you.*

1 Class	2 Name	3 For use on	4 Remarks	5 Supplier	6 Key No.
Acid	Brilliant Alizarine Light Blue 3FR	Wool, nylon, silk	Recommended for baby blue shades in yarn or piece; primarily for self shades; brilliant; noteworthy light-fastness on silk and nylon.	Sandoz	J-301
Basic	Calcozine Acrylic— Yellow G Yellow 2R Orange 3R Red 3G Violet 3R Blue G	Acrylics, true and modified	Dye to the yarn core without need of expensive retarders (common salt and acetic acid are used) and can be stripped back by boiling with salt; brilliant; build up well; excellent fastness characteristics; show little tendency to stain animal or cellulosic fibers—cross dye under positive control.	American Cyanamid	J-302
Basic	Genacryl Red 4B	Acrylics, true and modified	Yields a bright, bluish red shade and is recommended for dyeing economical, deep shades of jockey red, scarlet, and cardinal; very good fastness to washing, perspiration, dry-cleaning, and crocking.	General Aniline	J-303
Direct	Sirius Supra Yellow GRLL	Cotton and rayon	Has outstanding fastness to light and very good leveling properties; very good solubility; works with Sirius Supra Blue F3GL-CF to produce greens in which blue is not cannibalized.	Verona	J-304
Disperse	Calcosperse— Yellow GL Yellow 4RL Brilliant Orange 2R Orange 3RD Scarlet 2G Red B Red 2R Blue B Violet B	Polyesters	Applied by currently acceptable methods and require no extra nor special attention during the application; maintain high standards of fastness to light, washing, drycleaning, perspiration, hot pressing, atmospheric fading, and crocking.	American Cyanamid	J-305
Disperse	Foron Brilliant Blue GFLN	Acetate, triacetate, polyesters	Brighter in shade and faster to light than its companion Foron Blue GFL; offers improved dispersibility; stable to dyeing at the boil.	Sandoz	J-306
Disperse	Dacryl Green LFG	Polyesters, acetate, polyamide	Excellent fastness to washing, drycleaning, sublimation, and light on polyesters; product applied with conventional carriers or at elevated temperatures without carriers; excellent stability at high temperatures; exhausts well in neutral baths; superior pile-on properties; recommended for stock, yarn, and fabrics, knit and woven.	Althouse	J-307
Fiber Reactive	Reactone— Scarlet GL Brilliant Red BGL Blue 2GLD Grey GL	Cellulosics	Brilliant reactive colors for printing or padding; excellent solubility; stable in alkaline solutions; have no substantivity for cellulose in the absence of salts—washing off of unfixed dye after fixation is extremely simple; can be used to produce wide range of shades from dull to very bright.	Geigy	J-308
Fluorescent White	Phorwite— BBu Extra Powder BBN Solution	Cellulosics	Brightening agent for cellulosic fibers; neutral shade; exceptional solubility; compatible with most commonly used resins; its very good wash fastness makes it particularly suitable for application in discharge printing; exhaust favored by electrolytes.	Verona	J-309
Neutral Metalized	Lanamid Grey GBL	Wool, silk, nylon	Very good fastness to light, and to washing; has better leveling properties than its companion Grey G; good solubility at 1:40; superior nondusting properties.	Allied Chemical	J-310

More new dyes

1 Class	2 Name	3 For use on	4 Remarks	5 Supplier	6 Key No.
Neutral Metalized	Lanamid Violet 2BL	Wool, nylon	Approximately equal in strength, though bluer, than Violet RL on both wool and nylon; good solubility; suitable for low-temperature dyeing; wash- and lightfastness practically as for Violet RL.	Allied Chemical	J-311
Vat	Veranthrene Yellow F3GC Powder Ultrafine	Cellulosics	Homogenous, produces a bright yellow and does not cannibalize blues in green combinations; excellent leveling and all-round fastness properties.	Verona	J-312
Vat	Calcoloid Olive TL Single Paste	Cellulosics	Gives particularly good leveling results in pad-steam work—no special chemicals, gums, or infrared dyeing apparatus needed; recommended for package dyeing; excellent coverage; top fastness ratings; highly satisfactory shading color for olive greens and khakis; nonspecking.	American Cyanamid	J-313
Vat	Calcoloid Blue GCD Double Paste	Cellulosics	Outstanding in fastness, excellent physical form, controlled particle size.	American Cyanamid	J-314
Vat	Calcoloid Dark Blue B2R Single Paste	Cellulosics	Controlled particle size, recommended for package and beam dyeing.	American Cyanamid	J-315

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Virginia, North & South Carolina, Georgia & Tennessee

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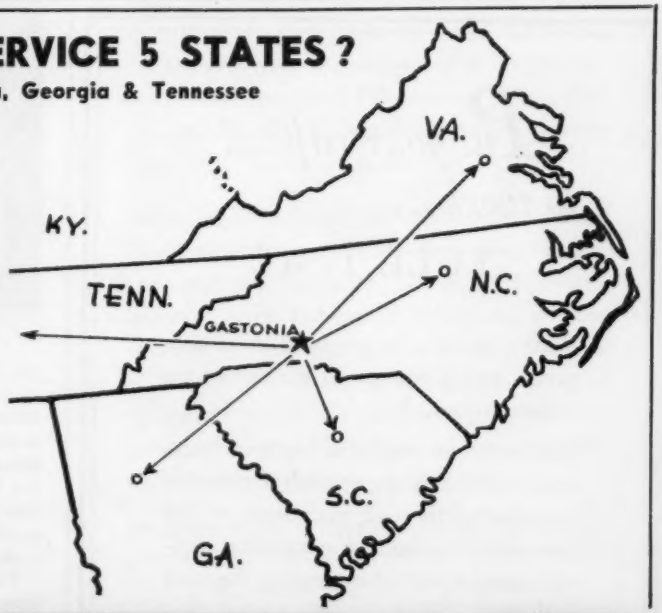
Our trained personnel will gladly explain our services and facilities. JENKINS Metal Products are numerous and are quality proven by years of service.

IN OUR 48th YEAR OF SERVICE



SINCE 1912 JENKINS METAL SHOPS INCORPORATED ENGINEERED PRODUCTS

JENKINS METAL SHOPS, Inc.

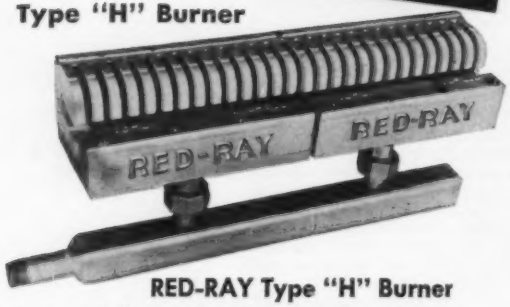
P. O. BOX 1160

GASTONIA, NORTH CAROLINA

COLOR MIGRATION?

PREVENT IT WITH INFRA-RED

Type "H" Burner



RED-RAY Type "H" Burner —true infra-red, prevents color migration in pigment dyeing. Write now for further information to:

RED-RAY MFG. CO., INC.
318 CLIFF LANE • CLIFFSIDE PARK, N. J.
Tel.: WHitney 3-1000

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FULL TIME

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Non-corrosive equipment *(from page 195)*

glass-smooth surface, and corners are rounded for trouble-free loading, unloading, and cleaning.

Light weight and strength are other advantages of the products in the line which includes yarn conditioning boxes, doff boxes, trays, and baskets. All items can be made to any specifications. Should repairs ever become necessary, they can be made simply and easily.

Carolina Fiberglass Products Co., Wilson, N. C.

Do you want more data? Write ◂ or use card on page 207; list J-109

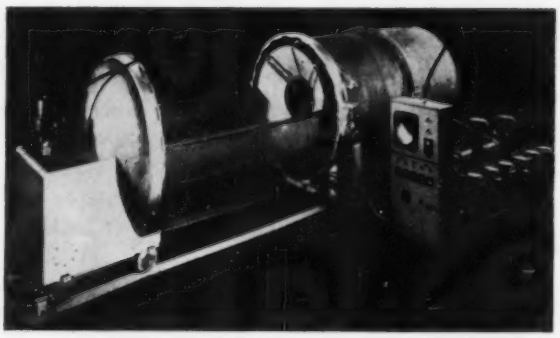
Premium performance, 50% more bobbin life

Stehedco Durapreg bobbins are vacuum impregnated with tough thermosetting resins to give them an extremely hard, smooth, and durable finish. Originally introduced to resist the crushing force of nylon, the same qualities make it ideal for longer life in all bobbin applications. The resin has a low rate of moisture absorption assuring greater dimensional stability. After the bobbins are in operation, they stay straight, hold their precision, and last 50% longer than conventional ones. Made in all styles and sizes for the highest speeds on top drive spinning and automatic winders, and in standard and special finishes for all types of yarn, they possess remarkably little run-out to upset balance.

Steel Heddle Mfg. Co., Southern Shuttles Div., Greenville, S. C.

Do you want more data? Write ◂ or use card on page 207; list J-110

Automatic, 1000-lb capacity fiber setter



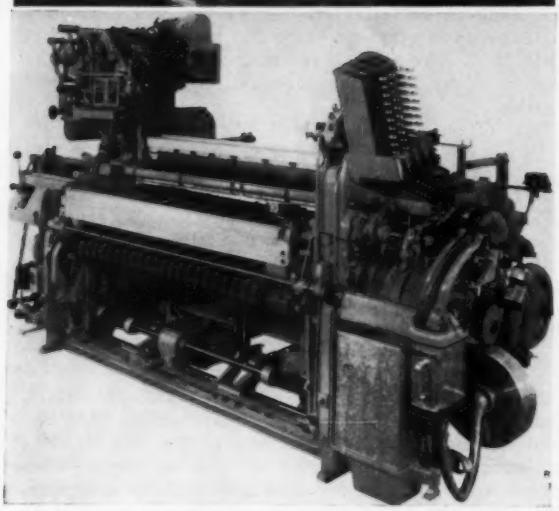
A 1000-lb capacity Fiber Setter, the Model FS-1000, for processing synthetic fibers in skeins, on bobbins, or as sliver, has more than three times the capacity of other Turbo Fiber Setters. Steam is produced in the cylinder by means of a boil-off, eliminating the possibility of super heated steam coming into contact with the fibers being processed. There is no need for a separate bulking operation, as the machine maintains the proper amount of moisture in the material being processed.

The basket carrier is mounted on the door and moves into the cylinder automatically at the push of a button. During processing, the basket can be rotated or oscillated, thus eliminating the need for a separate bulking operation. When the processing is completed, the door opens automatically and moves out of the cylinder on the trolley to the unloading position. The basket rotates at the push of a button for unloading fibers on conveyor, truck, or table. The equipment requires 17′ x 26′-6″ of floor space.

Turbo Machine Co., Lansdale, Pa.

Do you want more data? Write ◂ or use card on page 207; list J-111

Insert filling as "cartridge clips"



Ruti Machinery Works, Switzerland, have perfected a filling supply system that allows the weaver to lift a case or clip of 12 packages from a turret atop the loom and place it in the appropriate slot of the 4 x 1 box loom filling container without having to wrap the ends about a filling holder. The turret is built to accept complete units, comprising four replenished containers, from the magazine filler. The complete units are filled automatically at the pirn winder. A second system adapted to the 4 x 1 loom consists of four slots (see photograph) into which the battery filler simply slips the individual packages of the appropriate color. Since the filling ends are not wrapped around a thread holder, filling time is reduced about 60% over conventional 4 x 1 operations.

H. J. Theiler Corp., Ashmont Ave., Whitinsville, Mass.

Do you want more data? Write ◂ or use card on page 207; list J-112

Moramine SCM Softens ANY Fabric

Moramine SCM gives a high degree of surface hand and good flexibility to any fabric, even to such hard-to-soften fabrics as twills and fabrics treated with resins for purposes of shrink-proofing and wrinkle resistance. When added to last rinse on smooth faced fabrics it also prevents "mark-offs" and "lay" marks.

Moramine SCM is instantly dispersable in water at all temperatures, thereby eliminating troublesome and time consuming procedures. It greatly improves crock fastness of colors and is quite resistant to washing and dry cleaning. Moramine SCM is cationic in nature and can be exhausted in systems where this is desirable. It will not yellow at normal high temperatures, and does not affect light-fastness of dyestuffs.

Moramine SCM is excellent on any fabric and gives superior softness on difficult fabrics. Write for sample and full information.

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Transfer
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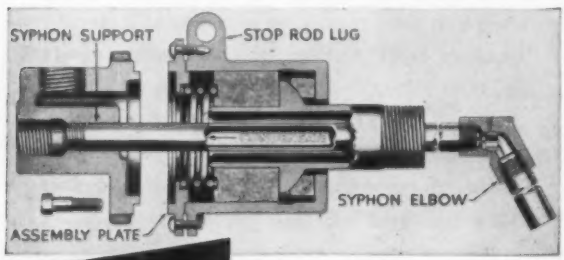
TRY THIS on your Dry Cans and 30" Slasher Cylinders

We'll gladly furnish a pair of these units for 90-day obligation-free trial in your mill. The Type SB2P is self-supporting, completely packless, needs no lubrication or adjustment. The Johnson Syphon Elbow permits the use of two straight pipes instead of an unwieldy curved syphon pipe, is hinged to pass right through the joint.



Johnson ROTARY PRESSURE **Joints**
First in the Textile Industry

Write for Catalog S-3002

Shows self-supporting Johnson Joints for all needs . . . on print cans, calenders, compressive shrinkage ranges, big 5' and 7' cotton slashers, dry cans, etc.

THE JOHNSON CORPORATION
815 Wood St., Three Rivers, Mich.

Finishes and chemicals

A chemically reactive nonionic softener for application to textile fibers is called Rezsoft NI, a fully reactive, nonionic, nonchlorine retentive, nonyellowing product. Chemically, the product is a nonionic ethoxalated long chain alkyl hydroxylate ester which is available both as a fluid, smooth white paste which is readily dispersible in warm water, and as a 100-per-cent material which is readily dispersible in water of 75 to 80 C. It is compatible with almost all resins, catalysts, and other finishing agents. It offers outstanding lubrication and antistatic properties in such operations as schreinering, napping, embossing, and weaving.

Metro-Atlantic, Inc., Centredale, R. I.

Do you want more data? Write supplier or use card on page 207; list J-204

A low-cost inorganic fire retardant of the renewable type, recommended for treating all natural and most synthetic fibers, imparts exceptionally good resistance to fire and flame, and with complete control of afterglow. Furthermore, Fire Retardant RC has a definite protective action minimizing discoloring and or tendering of textiles under high heat or extended heat exposure in drying or curing. Applied by padding, the compound is 100-per-cent active and adds weight in proportion to the amount applied. It is not washfast. For extreme conditions, Fire Retardant RCX is recommended.

Burkart-Schier Chemical Co., Chattanooga, Tenn.

Do you want more data? Write supplier or use card on page 207; list J-205

A nonionic surfactant called Dowfax 9N9 contains 9 to 10 moles of ethylene oxide and has a cloud point of 52 to 56 C. The agent is recommended for a number of uses including detergents, industrial cleaners, paper, and textiles.

Dow Chemical Co., Midland, Mich.

Do you want more data? Write supplier or use card on page 207; list J-206

A new nonionic softener and napping aid, Nopcotex NP-25, is recommended for use on cotton and synthetic fabrics. As a pure finish it has excellent resistance to yellowing, and it also functions as a lubricant, aiding in cutting and sewing operations.

Textile Chemicals Department, Nopco Chemical Co., 60 Park Pl., Newark, N. J.

Do you want more data? Write supplier or use card on page 207; list J-207

A cationic textile softener (Atlas G-3573) for natural and synthetic fibers, is a 100 per cent active, light colored softener possessing the outstanding characteristic of being readily formulated by the textile chemical compounder as a 25 per cent active fluid dispersion. This fluid dispersion can be handled easily by the mill, and using conventional methods, it can be applied to cotton, rayon, the synthetics and wool.

Atlas Powder Co., Wilmington 99, Del.

Do you want more data? Write supplier or use card on page 207; list J-208

The film-forming agent called Resin D-566 is potentially useful where a low-tack, abrasion-resistant, high-strength film with high adhesion is required. It can also be combined with water-soluble or water dispersible thermosetting resins. A plasticized dispersion of a high-viscosity polyvinyl butyral resin, its suggested areas of application include decorative and protective coatings for metal, glass, textiles; as a nonwoven fabric binder; and greaseproof or washable coating for paper and textiles.

Shawinigan Resins Corp., Springfield 2, Mass.

Do you want more data? Write supplier or use card on page 207; list J-209

The cationic softener Ceranine PN is for use with polyacrylonitrile fibers—a broad category which could include Orlon, Dynel, Creslan, and Darvan. It may be applied at any stage in production to give a soft, lofty, cashmere-like hand and to improve winding, weaving, knitting, and sewing properties. It also acts as an antistatic agent on synthetic fibers in general.

Sandoz, Inc., 61-63 Van Dam St., New York 13, N. Y.

Do you want more data? Write supplier or use card on page 207; list J-210

The optical brightener Leucophor A is designed for application in acid finishing baths where it gives much-better-than-average yield—it may be applied in synthetic resin finishing baths with acid catalysts.

Sandoz, Inc., 61-63 Van Dam St., New York 13, N. Y.

Do you want more data? Write supplier or use card on page 207; list J-211

A self-emulsifiable wax, with a melting point of 120 F, will form permanent emulsions containing as much as 90 to 95 per cent water in neutral, acid, or alkaline solutions. Called Emulsifiable Hywax 122, it forms a white, creamy lotion with no odor or separation, even after standing for weeks. Free of odor, light in color, heat stable, it will not oxidize nor turn rancid. Recommended for textile operations, it is not water soluble—and one-per-cent solutions separate.

Werner G. Smith, Inc., 1730 Train Ave., Cleveland 13, Ohio.

Do you want more data? Write supplier or use card on page 207; list J-212

A dye bath assistant, highly effective in eliminating barré marks when dyeing nylon with selected acid dyes, and when properly used does not affect adversely the light fastness of the fabric. Algepon #281 is easy to use and is also economical, requiring only four per cent on the weight of the goods for best results. A modified cationic compound, it has a slight acid reaction, with a pH range of 5.0 to 5.5.

Arkansas Co., Inc., P. O. Box 210, Newark 1, N. J.

Do you want more data? Write supplier or use card on page 207; list J-213

A dyeing retarder for use in dyeing 100-per-cent Orlon with cationic dyes produces exceptionally uniform and level dyeings. Having a continuous retarding effect throughout the dyeing cycle, Algepon #230 is particularly applicable for dyeing light and pastel shades. Acid in reaction (with a pH from 5.0 to 5.5), it is readily soluble in water and is best applied after scouring the goods with a nonionic detergent and rinsing.

Arkansas Co., Inc., P. O. Box 210, Newark 1, N. J.

Do you want more data? Write supplier or use card on page 207; list J-214

A printing carrier that increases color yield of disperse dyes also gives maximum sharpness and clarity to prints. Called Sharprint, it may be added directly to the print color paste by volume and processed after printing by cottage steaming, aging, or curing. There is no sacrifice of printing sharpness in either wet or dry fixation.

The Harshaw Chemical Co., Zinsser Div., Hastings-on-Hudson 6, N. Y.

Do you want more data? Write supplier or use card on page 207; list J-215

A highly stable latex, a water dispersion of polyvinylidene chloride resin, may be stored or shipped over long distances without risk of breakdown. Called Resyn 3600, it is supplied at 50 per cent solids of the 0.05 micron size. The resin may be used for coating, impregnating, and as a binder for nonwovens.

National Starch and Chemical Corp., 750 Third Ave., New York 17, N. Y.

Do you want more data? Write supplier or use card on page 207; list J-216

Continued on next page

SMOOTH OUT PROCESSING LOSSES

® FREE-WHEELING ®
EXPANDERS
VARI-BOW and FIXED BOW ®

ELIMINATE ▶ WRINKLES
LOSS of WIDTH
DISTORTION

No need to "suffer-through" frequent periods of downtime in a vain attempt to correct processing problems.

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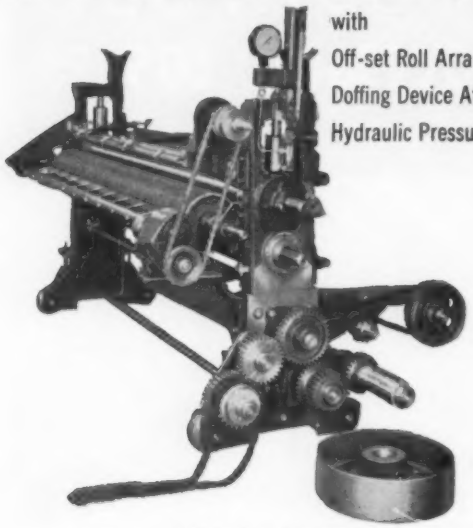

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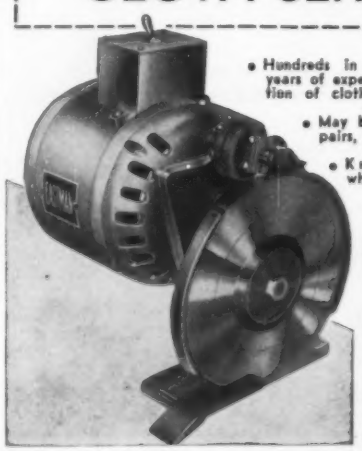

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The cationic softener called Onyxsan FW-25%, will disperse in tap water, thereby eliminating the necessity of boiling or cooking with open steam. White in color, with a high resistance to discoloration, it has suggested uses as a lubricant for acid fulling, an exhaust-type softener for long bath applications, and a yarn and skein lubricant following dyeing.

Onyx Chemical Corp., 190 Warren St., Jersey City 2, N. J.

Do you want more data? Write supplier or use card on page 207; list J-217

An acrylic resin dispersion has excellent durability to laundering and drycleaning, inherent flexibility, superior stability, and high film strength. The resin, Rhoplex HA-12, is a self-crosslinking polymer, closely related in performance to Rhoplex HA-8, a low-temperature-curing acrylic resin. The new resin may be crosslinked simply by the addition of a catalyst such as Catalyst A and curing at low-to-medium temperatures. It may be applied to nonwovens by spray as well as saturation, and may be used as a backing for automotive and upholstery fabrics.

Rohm & Haas Co., Washington Square, Philadelphia 5, Pa.

Do you want more data? Write supplier or use card on page 207; list J-218

"Tailor-made" carpet and upholstery latices are available in the Dylex series, a group designed to fit the exacting demands of the textile industry. Two distinctly different types (for conventional and nonvulcanized coatings) are offered with a variety of co-polymer ratios available in each.

Koppers Co., Inc., Pittsburgh 19, Pa.

Do you want more data? Write supplier or use card on page 207; list J-219

New way to determine life expectancy of fibers

An instrument about the size of a typewriter, the Fiber Flex Tester, measures the wear resistance of up to ten fibers as they are flexed back and forth over the corner of a pencil-thin carbide bar. The more flexing cycles (100 a minute) a fiber can endure, the longer its life expectancy.

When the fibers break, they drop into small glass cylinders below. Weights which pull the fibers taut stop the mechanical counters set in the face of the machine so that they indicate the number of cycles the fibers withstood.

Fibertest, Inc., Arcweld Building, Grove City, Pa.

Do you want more data? Write or use card on page 207; list J-113

New speed reducers are more powerful

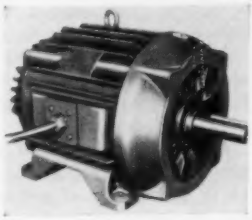
Speed reducers in a recently announced line are capable of transmitting up to 80 per cent more horsepower than that carried by conventional worm gear units. Use of fan-cooling, centrifugally cast bronze gears, and a special heat treating technique on alloy steel worms permit substantially higher horsepower input and output torque ratings with smaller units.

Cleveland Worm & Gear Div., Eaton Mfg. Co., Cleveland 10, Ohio.

Do you want more data? Write or use card on page 207; list J-114

Equipment briefs

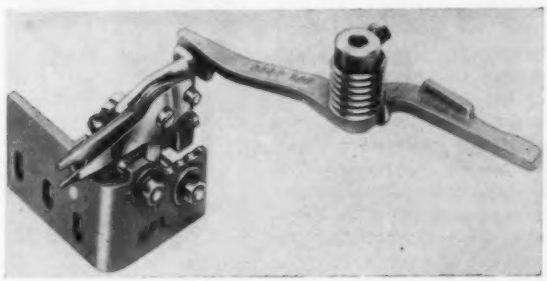
Textile motor offers greater flexibility. The Allis-Chalmers Type GZQ textile motor has been redesigned so that mill personnel can mount the fan on either end, thereby directing air flow in relation to the driven machine. A protective guard is supplied for use when the fan is on the front end of the motor which has pre-lubricated, double - width, single-row ball bearings and is available in a wide range of sizes.



Allis-Chalmers Mfg. Co., Industries Group, Box 512, Milwaukee 1, Wis.

Do you want more data? Write supplier or use card on page 207; list J-220

A lay-mounted, scissor-type thread cutter, designed especially for use with C&K S-5 and S-6 (Regular) and S-6 (Big Six) looms and designated Model 4962, offers these benefits: (1) Lay mounting gives automatic positioning and assures positive, straight-line motion into



the shuttle—there is no swinging; (2) sidelines and drag-ins are prevented—the device traps and cuts cleanly all types and sizes of filling without special adjustments; (3) cutting blades are self-sharpening and made of heat-treated, high-carbon steel for greater durability.

H. F. Livermore Corp., Allston Station, Boston 34, Mass.

Do you want more data? Write supplier or use card on page 207; list J-221

Size 00 starter cuts costs, saves space. A new NEMA Size 00 starter is available for low-horsepower jobs. Rated from ¾ hp 110 volts to 2 hp 440/550 volts for 3-phase service, it costs less than the Size 0 starters which previously were specified for these applications. Dimensions of the open device are only 3 13/16 x 3 3/16 x 3 45/64. Featuring easy inspection and maintenance, the new starter has straight-through wiring, pressure wire terminals, molded coil, and one-piece melting alloy overload relays for complete motor protection. It is available either open or in a NEMA Type 1 enclosure with optional pushbutton or selector switch in the cover. It also is available without overload relays.

Square D Co., Department SA, 4041 N. Richards St., Milwaukee 12, Wis.

Do you want more data? Write supplier or use card on page 207; list J-222

Long-life, thick Teflon covering for rolls. A relatively thick Teflon covering is now available for steel, aluminum, and bronze rolls to keep materials from adhering to them. Seamless, homogenous curing of the Teflon to these metals assures long life. Adhesion to metal is so

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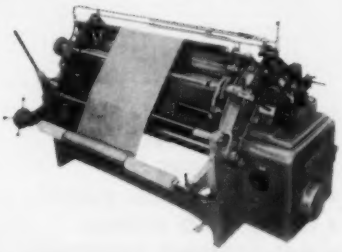

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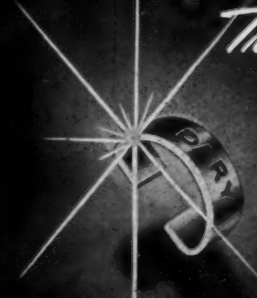

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complete that tests usually result in tearing of the cover rather than a loosening at the bond. The covers may be reground if necessary. Facilities are presently available to provide coatings up to .030" on rolls up to 4 ft in diameter and 15 ft long.

Roll Department, Manhattan Rubber Div., Raybestos-Manhattan, Inc., Passaic, N. J.

Do you want more data? Write supplier or use card on page 207; list J-223

A rubber-covered roll grinding aid, called "Sto-Talc," provides a smoother roll surface for grinding, dries up tacky roll surfaces, and minimizes grinding wheel loading up. On softer type rolls it facilitates the use of crown recording instruments and provides more accurate readings.

Stowe-Woodward, Inc., Newton Upper Falls, Mass.

Do you want more data? Write supplier or use card on page 207; list J-224

New platform-type bench scales, (Type 9600) for heavy-duty, general-purpose weighing operations are specially designed to provide continued accuracy under conditions of prolonged industrial usage. They have a minimum number of moving parts for maintenance-free operation. Overload and bumper springs guard against excessive shock in loading and unloading. An adjustable hydraulic dashpot controls weighing speed over a wide range for fast, accurate performance. A quick tare device, permitting 25 per cent of dial capacity to be tared off, can be provided as an extra accessory. Bench scales can also be made portable with special four-wheel rolling stands.

The Exact Weight Scale Company, 538 East Town Street, Columbus 15, Ohio.

Do you want more data? Write supplier or use card on page 207; list J-225

A seal-less (canned) centrifugal pump for the leak-proof handling of volatile, toxic, inflammable or other hazardous liquids has no mechanical seal, stuffing box or gland.

Built in 2 sizes with 1" and 1¼" discharge, the pumps have a capacity range up to 110 gal per min, heads up to 100 ft and are recommended for handling clear liquids only. Cooling of the motor and lubrication of all parts is accomplished by circulating a controlled portion of the liquid being handled through the housing and bearings. All pumps are equipped with a built-in thermal cut-out device.

Goulds Pumps, Inc., 203 Black Brook Rd., Seneca Falls, N. Y.

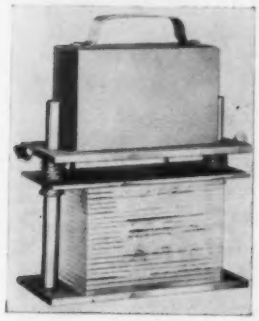
Do you want more data? Write supplier or use card on page 207; list J-226

A "do-it-yourself" self-curing repair kit enables industrial users to make permanent repairs to conveyor belting and other rubber products (wire insulation, raincoats, inner tubes, damaged belt edges, rubber covers, etc.) without special equipment, highly skilled personnel or the heat sources usually required for such operations. The Holdtite Belt Repair Kit consists of various styles and sizes of repair components—rubber and fabric-reinforced patches, sheet materials, putties and cements—and the simple tools required to do most repair jobs and an instruction manual. Separate components and tools

are available to replenish original kits.

United States Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y.

Do you want more data? Write supplier or use card on page 207; list J-227



New AATCC perspiration tester. The Atlas Model PR-1 perspiration tester will test from one to 20 samples at a time. Made of stainless steel with plastic plates and a metal weight, the instrument is loaded vertically. After top plate is locked in place with thumb screws, weight is removed and unit turned over and placed in oven in horizontal position. A ten-pound dead weight loading is utilized with springs compensating for any shrinkage occurring as specimens dry out.

Atlas Electric Devices Co., 4114 N. Ravenswood Ave., Chicago 13, Ill.

Do you want more data? Write supplier or use card on page 207; list J-228

A new textile testing service makes available to all textile mills for quality control and research the complete laboratory facilities of a textile machinery builder. Air-conditioned, dustproof, and humidity controlled throughout, the laboratory is equipped with instruments for testing at all stages in the yarn preparatory process from raw stock to twisted yarn. Adjacent to the laboratory is a pilot plant for processing samples.

Saco-Lowell Testing Laboratories, Saco-Lowell Textile Machinery Division, Easley, S. C.

Do you want more data? Write supplier or use card on page 207; list J-229

A fork lift truck achieves dramatic cost reductions in warehousing operations through design-engineering features that enable it to perform right or left hand stacking within the confines of a six-foot aisle—four to six feet narrower than that required by conventional fork

lift trucks. The unit, called the Naro-Aisle-Stack Model 590, also performs all of the functions of a regular lift truck. Its use can give 16 extra rows of storage space in a 200' x 400' warehouse simply by reducing the aisle space.

Towmotor Corporation, 1226 East 152nd St., Cleveland 10, Ohio.

Do you want more data? Write supplier or use card on page 207; list J-230

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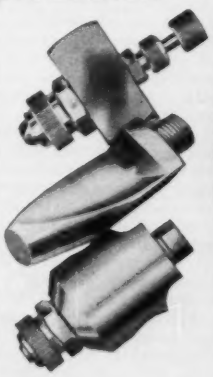

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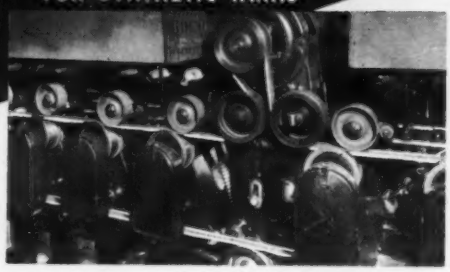

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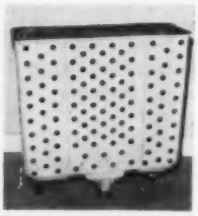

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FREE BOOKLETS

9-1 WATER REPELLENT AGENT—Brochure describes paraffin wax emulsion containing zirconium called "Persistol extra." Putnam Chemical Corporation, Beacon, New York.

9-2 SETTING TWIST IN DACRON FILAMENT—Bulletin gives effect of twist-setting conditions on yarn liveliness and fabric uniformity. Request bulletin D-120 Textile Fibers Dept. E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Delaware.

9-3 STAINLESS STEEL—Brochure tells how stainless steel meets the designer's needs and includes a special section on textile machinery application. Republic Steel Corporation, 1400 Republic Bldg., Cleveland 1, Ohio.

9-4 STRAPPING TOOLS—Brochure gives information on tailoring the strapping tool to the packaging job. Signode Steel Strapping Company, 2600 Northwestern Avenue, Chicago 47, Illinois.

9-5 SWITCH GEAR—Bulletin describes in detail compact 4160-volt stored energy switch gear. I-T-E Circuit Breaker Company, 1900 Hamilton Street, Philadelphia 30, Pa.

9-6 TEXTILE DRYERS—12-page bulletin describes extensive line of dryers for the textile industry. Includes data on related equipment. Andrews & Goodrich, 336 Adams Street, Boston 22, Mass.

9-7 REGOHM METER RELAY—Folder tells how machines may be controlled directly from microwatt signals. Electric Regulator Corporation, Norwalk, Conn.

9-8 FIBER BLENDING—Brochure describes completely automatic fiber blending equipment, including pictures and diagrams. Proctor & Schwartz, Inc., Seventh Street & Tabor Road, Philadelphia 20, Pa.

9-9 CONTINUOUS BLEACHING—Brochure tells how new machine paves way for "Super-Steam" continuous open-width pressure bleaching. Becco Chemical Division, Station B, Buffalo 7, New York.

9-10 HOSIERY PREBOARDER—Brochure describes automatic hosiery preboarder on which all operations except boarding and stripping are automatically controlled. Proctor & Schwartz, Inc., Seventh Street & Tabor Road, Philadelphia 20, Pa.

9-11 YARN IMPERFECTION COUNTER—Folder describes "Neptel" yarn imperfection counter with extremely simple calibration. Sheffield Corporation, Dayton 1, Ohio.

9-12 BALING PRESSES—Illustrated bulletin describes the four basic types of hydraulic baling presses that compose the line of 50 standard models. Consolidated Baling Machine Company, 197 Sixth Street, Brooklyn 15, New York.

9-13 TACHOGRAPH—Brochure describes means of graphically recording the rate and total output or speed of a particular machine. Wagner Electric Corporation, 6400 Plymouth Avenue, St. Louis 33, Mo.

9-14 PRECISION SCALES—Brochure describes complete line of specially designed textile scales. Exact Weight Scale Company, Columbus 15, Ohio.

9-15 MICRO-MEASURE—Bulletin describes miniaturized lubricant injector for automatic lubrication of production machinery. Lincoln Engineering Company, 4010 Goodfellow Blvd., St. Louis 20, Mo.

9-16 NEW RESIN DEVELOPMENT—Technical data on new polyvinylidene chloride latex, Resyn 3600 is available. Request Bulletin 340. National Starch & Chemical Corporation, 750 Third Avenue, New York 17, New York.

9-17 COMPLETE METAL FABRICATING—Series of bulletins describes complete range of services in metal fabrication. Sims Metal Works, West Point, Ga.

9-18 FINANCING BUSINESS ACTION—Booklet nontechnically describes financing business action under today's conditions, including loans, factoring, mergers, buyouts, etc. Walter E. Heller & Co., 105 W. Adams Street, Chicago 90, Illinois.

9-19 TEXTILE FIBER MATERIALS—Booklet describes the many fiberglas textile fiber materials and shows their wide range of application to industry. Owens-Corning Fiberglas Corporation, Toledo 1, Ohio.

9-20 DYLEX LATICES—Bulletin describes dylex textile latices, backsizing ingredients which are tailor-made for the textile industry. Koppers Company, Inc., Plastics Division, Pittsburgh, Pa.

9-21 METERING PUMPS—Brochure gives details on positive displacement, plunger-type pumps with great metering accuracy. Wallace & Tiernan, Inc., 25 Main Street, Belleville 9, New Jersey.

9-22 ROLLER BEARING TOP ROLLS—Booklet gives details on "Draftrite" roller bearing top rolls for cotton, worsted and synthetic spinning. SKF Industries, Inc., Front St. and Erie Avenue, Philadelphia 32, Pa.

9-23 WATER TREATMENT INSTRUMENTATION — Booklet describes typical water treating systems and shows how instrumentation has been applied to make these systems operate efficiently and economically. Minneapolis-Honeywell Regulator Company, Industrial Division, Wayne & Windrim Avenues, Philadelphia 44, Pa.

9-24 MATERIALS HANDLING RENTALS—Booklet outlines the advantages of renting materials handling equipment. Also includes chart for itemizing operating expenses. Clark Equipment Company, 485 Lexington Avenue, New York 17, New York.

9-25 FOAM CONTROL—Booklet presents the ABC's of fast, efficient foam control with silicone antifoamers. Dow Corning Corporation, Midland, Michigan.

9-26 APPLYING SILICONES—Publication shows how to apply silicones for the best performance in textile materials. General Electric, Silicone Products Dept., Waterford, New York.

BOOKLETS

raw stock to roving

T-101 **LUMMUS PEPPER - SHAKER OPENER.** Gives complete details and photographs. Aldrich Machine Works, P. O. Box 750, Atlanta, Ga.

T-102 **STATIC ELIMINATION.** How to eliminate static safely and inexpensively. Simco Co., 920 Walnut St., Lansdale, Pa.

T-103 **CARD GRINDING INFORMATION.** Care and operation of cards. B. S. Roy & Son Co., Worcester, Mass.

T-105 **VERSA - MATIC DRAWING FRAME.** Describes drafting elements, quality of sliver, roving and yarn possible. Saco-Lowell Shops, 60 Batterymarch St., Boston, Mass.

T-106 **SARGENT OPENER.** Describes opener with rotary evener and stripper. C. G. Sargent's Sons Corp., Graniteville, Mass.

T-107 **FEATHERTOUCH DRAFTING.** How to get "highest production per frame at lowest cost." Ideal Industries, Inc., Bessemer City, N. C.

T-111 **MAGNETIC IDEAS.** Booklet shows uses of permanent magnetic separation equipment in opening room as well as throughout mill. Removes tramp iron, prevents fires. Eriez Mfg. Co., Erie, Pa.

T-112 **ADVANTAGES OF ALDRICH PICKERS.** Good technical text, comprehensive pictures. Aldrich Machine Works, P. O. Box 750, Atlanta, Ga.

T-113 **NEW CONDENSER TAPE.** Describes Supr-O-Tape, an impregnated fabric condenser tape. Benjamin Booth Co., Allegheny Ave. & Janney St., Philadelphia 34, Pa.

T-119 **FIBER METER.** Automatic weighing and blending assures quality, holds variation to 1%. James Hunter, Inc., P. O. Box 298, Mauldin, S. C.

T-120 **PIN DRAFTERS.** Textile job report No. 21 tells how Warner & Swasey Pin Drafters help modify jute systems for carpet yarns. Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.

T-121 **UNIVERSAL CARD COILER.** Literature describes both head and base swivel for adjustment. Includes data on 90-day free trial. McDonough Power Equipment, Inc., McDonough, Ga.

T-122 **RECONDITION OPENING & CLEANING.** Bulletin gives whys and wherefores of reconditioning your opening and cleaning lines. Special attention given to each machine with suggestions as to parts replacement. Saco-Lowell Shops, 60 Batterymarch St., Boston 10, Mass.

T-123 **COILER CONVERSIONS.** Full facts on low initial cost conversion to larger coiler cans. Lists advantages, has complete description. Southern States Equipment Corp., Hampton, Ga.

T-124 **CARD DRIVE.** Bulletin 301-a describes simple, safe, efficient individual card drive. Southern States Equipment Corp., Hampton, Ga.

T-132 **PROCTOR SUPER PICKER.** Data sheet gives details of the Proctor Super Picker for use on slabs of baled cotton, or wool and synthetic blends in layers up to 12" thick. Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia 20, Pa.

T-133 **ANTI-STATIC AGENT.** Data sheet lists basic characteristics of liquid anti-static agent which eliminates processing difficulties with fibers due to static electricity. E. F. Houghton & Co., 303 West Lehigh Ave., Philadelphia 33, Pa.

yarn and warp making

T-201 **PRODUCTS FOR SPINNING AND WEAVING.** Complete line, applications, advantages shown. Dayco Corp., Textile Div., Dayton, Ohio.

T-202 **NEW BOBBIN MANUAL.** Complete bobbin guide. Lestershire Spool Division, National Vulcanized Fibre Co., Wilmington 99, Delaware.

T-203 **SPINDLE OIL.** "Gulfspin" insures against excessive wear and eliminates spindle wobble. Gulf Oil Corp., Gulf Bldg., Pittsburgh, Pa.

T-205 **HIGH SPEED AUTOMATIC QUILLER.** Lists advantages and dimensions of "Autocopser." Terrell Machine Co., Inc., P. O. Box 928, Charlotte, N. C.

T-208 **PACKAGED SPINNING MODERNIZATION.** Details on Collecto-Vac, Open-Aire Creels, Cross-Jet Cleaner, Air Conditioning. Bahnson Company, Winston-Salem, N. C.

T-209 **SECTIONAL WARPER.** Describes full width and sectional warpers for knitting, weaving. Robert Reiner, Inc., Weehawken, New Jersey.

T-210 **CONICAL RINGS AND FLYERS.** Complete details and specifications. Herr Manufacturing Co., Inc., 318 Franklin St., Buffalo 2, New York.

T-211 **PRECISE WINDING MACHINE.** For winding pineapple or straight cones and tubes of synthetics. Foster Machine Co., Westfield, Mass.

T-212 **AUTOMATIC CLEANING EQUIPMENT.** Working details and advantages of the Tri-Rail Cleaner. American MonoRail Co., 111 East 200th St., Cleveland 17, Ohio.

T-216 **SPINNING FRAME CONVERSIONS.** Big-package, new-frame results at half the cost. Meadows Mfg. Co., P. O. Box 10876, Station A, Atlanta, Ga.

T-217 **COLLECTO-VAC.** New development collects lint, fly and broken ends. The Bahnson Company, Winston-Salem, N. C.

T-219 **SPINNING AND TWISTER RINGS.** Complete details, pictures, price list. Whitinsville Spinning Ring Co., Whitinsville, Mass.

T-222 **SUCTION CLEANING SYSTEM.** Details on new Collector Unit Model C-4. Pneumafil Corp., Charlotte 8, N. C.

T-223 **FACTS ABOUT YOUR FLYERS AND SPINDLES.** Advantages of smooth flyer and spindle operation. Ideal Machine Shops, Bessemer City, N. C.

T-225 **LAPLESS ENDLESS SPINNER.** Full information available. Ton-Tex Corporation, 31 Columbus Ave., Englewood, N. J.

T-227 **SPINDLE OILING MACHINE.** Features and advantages noted. Wicaco Machine Corp., 4800 Stenton Ave., Wayne Junction, Philadelphia 44, Pa.

T-228 **HANDY SPINNING REFERENCE.** Shows traveler speeds, sizes of ring flanges. Saco-Lowell Shops, Parts Replacement Division, P. O. Box 327, Greenville, South Carolina.

T-229 **UNIRAIL UPTWISTER.** Higher yarn quality and better packages at faster speeds. Leesona Corp., P. O. Box 1605, Providence, R. I.

T-230 **PRECISION TEXTILE WINDING.** Tensions and density control for winding rubber cones. Kidde Textile Machinery Corp., Farrand St., Bloomfield, N. J.

T-231 **CONE WINDER.** Describes Model 102 winder, including applications. Foster Machine Co., Westfield, Mass.

T-232 **SHORT CUT TO STAPLE FIBER SPINNING.** Ten steps in operation of the Tow Stapler. Turbo Machine Co., Lansdale, Pa.

T-233 **WEAVER'S KNOTTER.** Instructions as to use, description. A. B. Carter, Inc., Gastonia, N. C.

T-234 **TEXTILE ROLL COVERINGS.** Describes complete line as well as other mill supplies. Armstrong Cork Co., Industrial Div., Lancaster, Pa.

T-239 **LARGE PACKAGE TWISTER.** Information on new anti-friction Jumbo Twister which carries a 14" bobbin with a 12" build. Meadows Mfg. Co., P. O. Box 10876, Sta. A, Atlanta, Ga.

T-241 **PACEMAKER TWISTERS.** Folder gives details on high production, outlines notable features. Whitin Machine Works, Whitinsville, Mass.

T-242 **RING SPINNING FRAME.** Folder presents description, illustrations and specifications of up-to-date Simplex ring spinning frames. Davis & Furber Machine Co., North Andover, Mass.

T-243 **ANTI-FRICTION TWISTER BEARINGS.** Find out how bearings helped make The Meadows Twister almost friction-free. Fafnir Bearing Company, New Britain, Conn.

T-246 **BETTER BEAMS.** Information on three ways to make better beams. Kidde Textile Machinery Corp., Farrand St., Bloomfield, N. J.

T-249 **VARI-SPEED MOTOR PULLEY.** Describes variable speed control through use of simplified three-major-part disc-assemblies with only one lubrication point. Reeves Pulley Co., Reliance Electric & Engineering Co., Columbus, Ind.

T-250 **SPINNING MODERNIZATION.** Booklet shows how lower costs and improved quality are obtained by spinning modernization. Roberts Company, Sanford, N. C.

BOOKLETS

T-255 NEW BOBBIN HOLDER. Details on streamlined, positive latching bobbin holder. Whitehead Die Casting Co., 1140 Zonolite Rd., Atlanta, Ga.

T-256 HUMIDIFIER PROTECTION — Brochure tells how "Rustex" can stop rust and corrosion and prevent discolored water in your humidifying system. Odorless and completely harmless to personnel, or goods. Anderson Chemical Co., Inc., Box 1424, Macon, Georgia.

slashing—weaving—tufting

T-301 COUNTING AND MEASURING DEVICES. Wide range of counting devices for all types of textile machinery. Veeder-Root, Inc., Hartford, Conn.

T-302 LOOM SUPPLIES. Describes complete line. E. H. Jacobs Northern Division, The Bullard Clark Co., Danielson, Conn.

T-304 LOOM PRODUCTION CHARTS. Celluloid card shows yards per loom per week. Ralph E. Loper Co., Greenville, S. C.

T-306 THE STORY OF STARCHES. History and information on manufacture and use of starches. National Starch & Chemical Corp., 750 Third Ave., New York 17, N. Y.

T-308 STEEL WARP BEAMS. Beams for both broadloom and narrow fabrics. Milton Machine Works, Inc., Milton, Pa.

T-309 PENFORD GUMS IN TEXTILES. Describes their excellent properties for warp sizing spun yarns. Penick & Ford Ltd., Inc., 750 Third Ave., New York 17, New York.

T-312 AIR SLASHER DRYER. Shows construction and operating details. Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia 20, Pa.

T-313 BUTT-TACKING SEWING MACHINE. Describes operation, installation of single thread butt-tacking sewing machine. The Merrow Machine Co., 28 Laurel St., Hartford, Conn.

T-314 LOOM REED BOOKLET. Describes in detail a variety of reeds. Steel Heddle Mfg. Co., 2100 West Allegheny Ave., Philadelphia 32, Pa.

T-315 COCKER EQUIPMENT. Information on warp sizer, beam warper, creels, tensions, back-winders, etc. Cocker Machine & Foundry Co., Gastonia, N. C.

T-318 FORMULAS FOR SLASHING ARNEL. Includes also information on warping, weaving and quilling. Textile Sales Dept., Celanese Corp. of America, P. O. Box 1414, Charlotte 1, N. C.

T-319 ECLIPSE STARCHES FOR TEXTILES. Data sheet describes use of thin-boiling starches in the textile industry, with particular emphasis on warp sizing. Physical and chemical data included. A. E. Staley Mfg. Co., Decatur, Ill.

T-321 COCKER SLASHERS. Complete specifications and advantages, including allied equipment. Cocker Machine & Foundry Co., Gastonia, N. C.

T-322 MOUNTS FOR LOOMS. Vinyl mount eliminates need for bolts or paste. Clark, Cutler, McDermott Co., 106 W. Central St., Franklin, Mass.

T-323 UNIFIL LOOM WINDER. Describes new concept of filling preparation which needs no quilling area. Leesona Corp., P. O. Box 1605, Providence, R. I.

T-324 ALIGNING LAYS. Setting instructions for step-by-step aligning. Draper Corporation, Hopedale, Mass.

T-325 TRAVELING LOOM CLEANER. Advantages of the new Oscillaire loom cleaner. Parks-Cramer Co., Fitchburg, Mass.

T-326 DRAPER REPAIR PARTS CATALOG. Contains illustrations covering all mechanisms and construction with complete listings. Draper Corporation, Hopedale, Mass.

T-327 BALING PRESSES. Describes complete line of motor-driven and hydraulic baling presses. Logemann Brothers Co., 3150 West Burleigh St., Milwaukee, Wis.

T-328 TEXTILE MACHINERY PARTS CATALOG. Describes complete line of Dayco and Thorobred textile parts. Dayco Corp., Dayton, Ohio.

T-329 COUNTING DEVICES. Describes complete line of counters for every application. Trumeter Company, 38 W. 32nd St., New York 1, New York.

T-331 STATIC BARS. Humorously illustrates how static can be overcome. The Simco Co., 920 Walnut St., Lansdale, Pa.

T-332 CARE OF DRAPER SHUTTLES. Describes how longer, trouble-free service may be obtained. Draper Corporation, Hopedale, Mass.

T-336 ONE-PIECE SIZING AGENT. Houghto-Size CW provides low kettle cost, results in free-running warp of high breaking strength, increasing weaving efficiency. E. F. Houghton & Co., 303 West Lehigh Ave., Philadelphia 33, Pa.

T-346 FACTS ON NON-WOVENS. Fact file on non-wovens tells of new machinery, new methods of handling fibers, new bonding agents, etc. Curlator Corporation, Textile Div., E. Rochester, N. Y.

T-347 NEW DRYING SYSTEM. Describes high capacity, custom engineered drying equipment for tufted plants. Dalton Sheet Metal Co., Inc., Dalton, Ga.

T-351 AUTOMATIC STOP MOTION. Complete information available on automatic stop motion for Titan warp tying-in machine. Edda International Corp., 468 Fourth Ave., New York 16, N. Y.

T-353 BACKING FOR TUFTEDS. How to get your tufting necessities with one telephone call. Fulton Cotton Mills, P. O. Box 1726, Atlanta 1, Ga.

T-355 NON-WOVEN FABRICS. Booklet gives outline of nature and history of non-woven and the manufacturing techniques of today. Booklet 56-219A. Chemical Div., Goodyear Tire & Rubber Co., Akron 16, Ohio.

T-358 LOOM SUPPLIES. Information on rod lubricant and applicator, sponge leather bunter, picker. Garland Mfg. Co., 54 Water St., Saco, Me.

T-362 SIZE THAT SATISFIES. Information on getting the correct size package for your mill. Also on Bingham line of slasher rolls. Stodghill & Co., 716 Ponce de Leon Place, Atlanta, Georgia.

T-363 RUBBER COVERED SLASHER ROLLS. Handy booklet tells how to get longer life and better performance from rubber covered rolls. Includes data on handling, storing and grinding. Stowe-Woodward, Inc., Dept. C., 181 Oak St., Newton Upper Falls 64, Mass.

knitting

T-401 SINGLEHEAD FULL - FASHIONED MACHINE. Literature on request from the Wildman-Jacquard Div., Draper Corp., Hopedale, Mass.

T-403 RASCHEL KNITTER. Describes new Raschel-type knitting machine. Kidde Textile Machinery Corp., Inc., Farrand St., Bloomfield, N. J.

T-406 NEEDLE OIL DOES NOT STAIN. Details on "Gulftex 39" developed for knitting mills. Gulf Oil Corp., Gross & PRR, Pittsburg 30, Pa.

T-407 KNITTING MACHINES. Information on Wildman "TFS" 30" single section F-F machines and "AL" 30" diameter 32-feed "single purpose" circular interlock machine (rib type) Wildman-Jacquard Div., Draper Corp., Hopedale, Mass.

T-409 KNIT GOODS FINISHING MACHINERY. Data on calenders, shrinkers, curers, extractors, steamers. Tubular Textile Machinery Corp., 33-61 54th St., Woodside, N. Y.

T-410 "READING" TYPE 60 F-F KNITTING MACHINE. Information about the new "Reading" Type 60, 38-section automatic full-fashioned hosiery knitting machine. Write Textile Machine Works, Reading, Pa.

wet processing

T-500 WEBB GUIDE SYSTEMS. Folio No. EG-84 describes webb guide systems for cloth applications. G.P.E. CONTROLS, INC 240 E. Ontario St. Chicago 11, Ill.

T-501 TUBES FOR PACKAGE DYEING. Describes Dytex tubes for one-time use. Sonoco Products Co., Hartsville, S. C.

T-502 FINISHING MACHINERY. Text and photographs of complete line of machinery. Marshall and Williams Corp., 46 Baker St., Providence, R. I.

T-503 WATER ANALYSIS. Includes tables, conversion factors, indicators, standard solutions. Solvay Process Div., Allied Chemical Corp., 61 Broadway, New York 6, N. Y.

T-504 UREA FORMALDEHYDE. Literature on urea formaldehyde or U.F. concentrate-85. Dept. CUFI-29-1, Nitrogen Div., Allied Chemical Corp., 40 Rector St., New York 6, New York.

T-506 CATIONIC SURFACE ACTIVE AGENT. Describes Uversoft "D." Harshaw Chemical Co., 1945 East 97th St., Cleveland 6, Ohio.

T-507 CONTINUOUS STARCH COOKER. Booklet shows how the use of continuous cookers for starch assures accurate control, economy, low maintenance in warp sizing and finishing Clinton Corn Processing Company, Clinton, Iowa.

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T-543 INDUSTRIAL BRUSHES. Features use on shears, printing machines. M. W. Jenkins' Sons, Inc., 444 Pompton Ave., Cedar Grove, N. J.

T-544 WASTE HEAT RECOVERY. Describes system of waste heat recovery from polluted water. Ludell Mfg. Company, 5200 West State Street, Milwaukee, Wis.

T-545 WASHERS FOR SCOURING, BLEACHING, ACIDIFYING. Describes high capacity, continuous process washers. C. G. Sargent's Sons Corp., Graniteville, Mass.

T-546 NAPHTHOL FOR LIGHTFAST BROWNS. Booklet describes new, straight, non-substantive naphthol. Naphthol As-BN, for the continuous naphtholation of cotton and rayon piece goods in the dyeing of economical, fast-to-light browns. General Dyestuff Co., 435 Hudson St., New York 14, New York.

T-547 SOFTENER LUBRICANT, NAPPING AID. Technical information available on softener, lubricant and napping aid for natural and synthetic fibers, yarns and fabrics. Nopco Chemical Co., Harrison, N. J.

T-548 HANDBOOK ON METHOCEL. Gives technical information and use data on family of methylecellulose ethers called Methocel. Organic Chemicals Sales, The Dow Chemical Co., Midland, Mich.

T-550 POLYVINYL ACETATE EMULSION. Bulletin contains a description of Celanese emulsions and cites advantages of Celanese polyvinyl acetate emulsions in textile finishing. Celanese Chemical Co., 180 Madison Ave., New York 16, N. Y.

T-554 INSTRUMENT CATALOG. Complete information on industrial instrument accessories and supplies, Includes specifications, parts numbers and prices. Catalog 500, Foxboro Co., Foxboro, Mass.

T-556 HUNTER DYEING EQUIPMENT. Describes fully with diagrams Hunter Model A Dye Becks, Hunter No/Lap Reels, Model S Dye Kettles, Open Width Dye Kettles, Sample Dye Kettles. James Hunter Machine Co., North Adams, Mass.

T-557 HIGH ACTIVITY CATALYST. Technical bulletin describes new catalyst AC-6 which provides increased activity, excellent bath life, minimum odor formation, etc. Monsanto Chemical Co., Plastics Div., Springfield, Mass.

T-558 CATIONIC DYE LEVELER. Bulletin TX-34 gives new information on dye leveler for acid colors on nylon tricot and wool through use of Nopco 1425-B. Nopco Chemical Co., Textile Chemicals Div., Harrison, N. J.

T-559 FLOW CONTROL Complete information on largest selection of values to handle flow control requirements. William Powell Co., 2525 Spring Grove Ave., Cincinnati 22, Ohio.

T-561 PUMP POURABLE PASTES. Bulletin tells how Moyno pumps can pump any textile liquid that can be forced through a pipe, even if highly viscous or corrosive. Robbins & Myers, Inc., Springfield, Ohio.

T-563 POLYETHYLENE FINISHING AGENT. Booklet contains information needed to adopt Emulsifiable A-C polyethylene as a finishing agent to any particular process. Semet-Solvay Petrochemical Div., Allied Chemical Corp., 5th Floor T, Rector Street, New York 6, N. Y.

T-564 HYDROGEN PEROXIDE BLEACHING. Booklet discusses advantages, operating details and savings in chemical costs of Activated Hydrogen Peroxide Bleaching Process for Cotton Solvay Process Div., Allied Chemical Corp., 61 Broadway, New York 6, N. Y.

T-566 ETHYLEX GUMS. Brochure describes properties of hydroxy ethyl ether derivatives of corn starch. Applications of these noncongealing gums in warp sizing and finishing covered. A. E. Staley Mfg. Co., Box 151 Decatur, Ill.

T-570 CARPET DRYERS. Details, pictures, drawings on driven roll, conveyor, and tenter types. Andrews and Goodrich Div., 336 Adams St., Boston Dorchester, Mass.

T-572 DYEING MACHINERY FOR EVERY PURPOSE. Illustrated literature available on complete line of automatically controlled machinery. Gaston County Dyeing Machine Co., Stanley, N. C.

T-576 YARN PREPARATION. Describes products for yarn preparation, printing, finishing. Polymer Industries, Springdale, Conn.

T-577 STAINLESS DRY CANS. Information on stainless steel, 75 psi, reverse dished, head dry cans. Can be furnished Teflon-coated if desired. Sims Metal Works, West Point, Ga.

T-579 AUTOMATIC GUIDING EQUIPMENT. Catalog shows various types of automatic guiding equipment for accurate cloth guiding. Fife Mfg. Co., Inc., P. O. Box 9815, Oklahoma City, Okla.

fibers and yarns

T-601 FORTISAN-36, NEW TEXTILE FIBER. Includes charts, diagrams, text, presents technical properties. Textile Sales Dept., Celanese Corp. of America, P. O. Box 1414, Charlotte, N. C.

T-602 CAPROLAN NYLON HEAVY YARNS. Describes strength, long flex life and ready dyeability. Fiber Sales Dept., National Aniline Div., 261 Madison Ave., New York 16, N. Y.

T-603 RAYON—MILE BY MILE. Details on how rayon is produced mile by mile, perfect inch by inch. Industrial Rayon Corp., 500 Fifth Avenue, New York 18, N. Y.

T-604 THE CHEMSTRAND NYLON Story. Describes the birth and growth of Chemstrand Nylon. Chemstrand Corp., 350 Fifth Ave., New York 1, N. Y.

T-605 COLOR-FAST FIBERS. Further information on "Coloray," Courtauld's solution dyed rayon staple which is a contribution to color fastness in fabrics. Courtaulds (Alabama) Inc., 600 Fifth Ave., New York 20, N. Y.

T-606 "DIAL-A-FIBER" Ingenious circular chart indicates properties and compatabilities of "Uvitex" for application on natural and synthetic fibers. Ciba Co., Inc., Route 208, Fair Lawn, New Jersey.

T-608 TASLAN TEXTURED YARNS. Technical information on dyeing and finishing of new fabrics made with Taslan. E. I. du Pont de Nemours & Co., Wilmington 98, Delaware.

BOOKLETS

T-609 PROCESSING NYLON STAPLE. Data sheet describes method of processing Du Pont 42 Nylon Staple in blends with cotton. Covers complete operation through sizing. Bulletin N-93, E. I. du Pont de Nemours & Co., Inc. Wilmington, Del.

laboratory

T-701 TESTING INSTRUMENTS. Descriptions of 37 instruments for testing textiles. Custom Scientific Instruments, Inc., 541 Devon St., Kearny, N. J.

T-703 SHADOGRAPH WEIGHING DEVICES. Pictures and information on various types of scales. Exact Weight Scale Co., Columbus 8, Ohio.

T-705 STROBOTAC. Measures speed of rotating, reciprocating or other cyclic motions. General Radio Co., West Concord, Mass.

T-706 YARN COUNT SCALE. Data sheet tells how direct-reading instrument provides fast, accurate method of determining yarn number. Exact Weight Scale Co., Columbus 8, Ohio.

T-712 AUTOMATIC MOISTURE CONTROL. Booklet tells how Hunter Electro-Psychrometers are used in measuring percentage of moisture in all classes of textiles, whether yarns or fabrics. Hunter Controls, Inc., Div., James Hunter Machine Co., North Adams, Mass.

services for management

T-801 FACTORING SERVICE. Details on advantages of factoring, including information on general banking and pension plans. Trust Company of Georgia, Atlanta, Ga.

T-802 NON-WOVEN FABRICS. Report includes how non-woven fabrics are made, machinery involved, sample fabrics. Textile Fibers Dept., E. J. du-Pont de Nemours & Co., Inc., Wilmington 98, Del.

T-805 PROFIT THROUGH FACTORING. Brochure gives facts on the use of factoring as a modern plan for developing sound business growth and added profits. Walter E. Heller & Co., Dept. TI-2, 105 W. Adams St., Chicago 99, Ill.

T-807 GROUP INSURANCE. Information on how textile group insurance can insure the happiness of your employees and make for a better running mill. Provident Life and Accident Insurance Co., Group Dept., Chattanooga, Tenn.

T-808 FACTORING. Complete details on services offered as mill factors. L. F. Dommerich, 271 Madison Ave., New York, N. Y.

T-810 THE WONALANCET WAY is the title of an editorial booklet published five times a year dealing with current problems. Write Wonalancet Company, 128 Burke St., Nashua, N. H.

T-812 BEECHCRAFTS FOR 1960. Booklet available from Southern Airways Company shows how Beechcraft executive airplanes can save executives time and money. Write Southern Airways Co., P. O. Box 718, Atlanta, Ga.

T-819 ORGANIZED LUBRICATION PAYS. Planning book entitled "Management Practices that Control Costs via Organized Lubrication" shows how to effect savings in five areas of plant operation. Available from Texaco, Inc., 135 E. 42nd St., New York 17, N. Y.

T-821 INVENTORY CONTROL. How a daily report of inventory condition mechanically producted on existing business machines showed a net direct payroll saving of more than 10,000 a year. Administrative Methods Dept., Werner Textile Consultants, 1430 Broadway, New York, N. Y.

plant operation

T-902 BELT LACING EQUIPMENT. Includes prices, specifications, etc. Clipper Belt Lacer Co., Grand Rapids, Michigan.

T-903 "MOTOR SELECTOR." How to select a-c motors for specific application. Bulletin B-2103. Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio.

T-904 GEARMOTORS, MOTORGEARS, AND FLUID DRIVES. Catalog supplies complete information on double, triple, and quardruple reduction gearmotors and motorgears. Electrofluid and fluid drives are also explained. Link-Belt Company, Dept. PR, Prudential Plaza, Chicago 1, Illinois.

T-907 WRAP UP LINT PROBLEMS. Automatic lint filter removes lint from air, winds it into disposable roll. Bulletin 234, American Air Filter Co., 275 Central Ave., Louisville 8, Ky.

T-908 TEXTILE MOTORS. Bulletin describes compete line of textile motors. Diehl Mfg. Co., Finderne Plant, Somerville, N. J.

T-909 COMPRESSORS. WB two-stage water-cooled. Space-saving units require modest foundation up to 125 psi and 1150 cfm displacement. Bulletin WB-10. Gardner-Denver Company, Quincy, Illinois.

T-910 MODERN LUBRICATION METHODS. A report to management tells how modern lubrication methods can help save thousands of dollars in three major economic areas of textile plant management. Describes twelve operating advantages of automatic lubrication systems. Lincoln Engineering Co., 4010 Goodfellow Blvd., St. Louis 20, Mo.

T-911 LEATHER BELTING. Selection, installation, proper maintenance. Atlanta Belting Co., 508-510 Whitehall St., S. W., Atlanta, Ga.

T-912 STORY OF NYLON BRISTLE. Tells of discovery and production, with special attention to "Tynex," a form of nylon ideal for use in brushes. M. W. Jenkins' Sons, Inc., 444 Pompton Ave., Cedar Grove, N. J.

T-913 "ONE-SHOT" LUBRICATORS. Bulletin describes wide field of application for one-shot lubricators on machines requiring closely controlled but infrequent oil feed. Bijur Lubricating Corporation, Rochelle Park, N. J.

T-914 INDUSTRIAL GREASES. Describes multi-purpose lithium soap industrial greases. Sinclair Refining Co., 600 Fifth Ave., New York, New York.

T-917 BLOWERS AND EXHAUSTERS. Full description, including detailed drawings. Buffalo Forge Co., 490 Broadway, Buffalo 5, N. Y.

T-918 PAINT STRIPPING BOOKLET. Explains simplified method of stripping paint. Oakite Products, Inc., 22 Thames St., New York 6, New York.

T-921 CATALOG OF NEEDLE BEARINGS. Design, application for five types of needle bearings. The Torrington Co., Torrington, Conn.

T-924 BALL BEARINGS FOR TEXTILE MACHINERY. Bearings for all phases of textile processing. The Fafnir Bearing Co., New Britain, Conn.

T-925 LUBRICATION OF BEARINGS. Helpful list of do's and don't to prolong bearing life. New York & New Jersey Lubricant Co., 292 Madison Ave., New York 17, New York.

T-931 NEW V-BELT DRIVES. Bulletin contains information on selection and operation of V-belt drives. Covers all types of V-belt drives. Dodge Mfg. Corp., Mishawaka, Ind.

T-932 SMOOTH ACCELERATION, DECELERATION. Describes eddy-current equipment for smooth, stepless acceleration and deceleration. Eaton Mfg. Co., 3307 14th Ave., Kenosha, Wis.

T-933 CATECHISM OF ELECTRIC MACHINERY. Booklet contains complete technical treatise on various electrical machines. Electrical terms defined. Fairbanks, Morse & Co., Fairbanks-Morse Bldg., Chicago 5, Illinois.

T-937 V-BELTS. Tells how raw materials and finished belts are tested and inspected. Quality control and experimental production covered. Booklet 5-51107, Dept. 794, Goodyear Tire & Rubber Co., Akron 16, Ohio.

T-938 EMERGENCY CHEMICAL CLEANING—Booklet tells how rust, scale and other deposits may be removed from heat exchange equipment, regardless of intricacy. Anderson Chemical Co., Inc., Box 1424, Macon, Georgia.

T-939 BOILER FEEDWATER TREATMENT. Bulletin describes BRAXON & FLAKO internal automatic boiler feedwater treatment and services of trained service engineers in eliminating the problems of scales, sludge, corrosion, etc. Anderson Chemical Co., Inc., P. O. Box 1424, Macon, Ga.

materials handling

T-1005 TRAMRAIL ENGINEERING AND APPLICATION. Data on how Tramrail equipment can cut handling costs. Cleveland Tramrail Div., Cleveland Crane and Engineering Co., 1036 East 289th St., Wickliffe, Ohio.

T-1007 MATERIALS HANDLING FOR TEXTILES. Shows how fibre trucks can increase efficiency, protect products. National Vulcanized Fibre Co., Wilmington 99, Del.

T-1013 TRUCKS DOFF, STORE, BECOME SPOOLER TRAY. Brochure tells how mobile boxes are being used as doff boxes, storage boxes, and spooler trays on Barber-Colman spooler. Fisher Mfg. Co., Hartwell, Ga.

T-1014 CARPET CORES, STORAGE TUBES. Literature on simplified storage and better cores for rugs. Sonoco Products Co., Hartsville, S. C.

T-1015 OVERHEAD CONVEYOR. Catalog features "Cable-Way" Overhead Conveyor which has low-cost, ease of installation, quiet operation and long life. Conveyor Division, The American MonoRail Co., Fourth and Franklin Sts., Tipp City, Ohio.

T-1016 GUIDE TO BETTER CLOSURES. For use as a guide for the evaluation of methods currently in use to effect economy and better production in the closure of fiber board boxes. Acme Steel Products Div., Acme Steel Co., 135th and Perry Ave., Chicago, Ill.

T-1020 AUTOMATIC WRAPPING. Tells how automatic packaging increases the sales appeal of textile products. Saves labor and materials and adds tamper-proof product protection. Write Hayssen Mfg. Co., Sheboygan, Wis.

T-1021 TUBES, BOBBINS, PIRNS. Information on world renowned yarn carriers, reliable as to stability, dimensions, weight. Emil Adolff (U. S. A. agents: Textube Corp., 695 Summer St., Stamford, Conn.).

T-1022 STRONG CORES. Data on lightweight, quality tubes and cores for textiles. Star Paper Tube, Inc., Rock Hill, S. C.

T-1023 MATERIALS HANDLING. Describes lightweight, durable, smooth products. Spaulding Fibre Co., Inc., Dover, New Hampshire.

T-1024 CONDITIONING TRUCK. Details on all-aluminum, non-rusting conditioning truck. Excel, Inc., Lincolnton, N. C.

PERSONAL NOTES

Herbert W. Devitt, Jr., has been appointed general manager of the new Borg Fabric division of Amphenol-Borg, Ltd., to be located in Whitstable, Kent, England.

Abraham Levin has been named general manager of the Fonda (N. Y.) Manufacturing Co., succeeding Philip Halperin, who has resigned.

Vernon P. Moore of the National Cotton Council, Memphis, Tenn., has accepted the position as head of the Department of Agriculture's cotton ginning laboratory in Stoneville, Miss.

J. Carl Park, Jr., has been named vice-president and general manager of the Walter T. Forbes Co. and Signal Thread Co., Chattanooga, Tenn.

W. Carlisle Neely, secretary of Clinton Cotton Mills and assistant secretary of Lydia Cotton Mills, recently was presented the "Citizen of the Year" award by the Lions Club of Clinton, S. C. Mr. Neely has been instrumental in making arrangements for the soon-to-be-constructed Bailey Memorial Hospital.

Alexander Stewart of Berkshire Hathaway, Inc., has been elected president of the Southern New England Textile Club. Other officers elected were: first vice-president— **Henry A. Truslow,** Ponemah Mills; second vice-president — **Richard F. Cook,** Darlington Fabrics; third vice-president — **Laverne A. Matthews,** Matthews Equipment Co.

William H. Entwistle, Jr., has been elected president of Sandhurst Mills, Inc., Rockingham, N. C. Mr. Entwistle will continue as treasurer of the firm.

Albert H. Goldstein, president of Penlyn Knitting Mills, Philadelphia, Pa., has retired. **Woodrow P. Bond** has been named president succeeding Mr. Goldstein.

Paul F. Collins has been named assistant product director in the grey goods division of Chicopee Mills, Inc.

John L. Hutcheson, 3rd, has resigned as vice-president and plant manager of Peerless Woolen Mills, Rossville, Ga.

Eugene Briggs has been named assistant plant manager of production for the Albany, Ga., division of A. & M. Karagheusian, Inc. **Justin M. Robinson** has assumed duties as assistant manager in charge of administration. * * * **G. Walter Bruning** has been appointed director of styling and products for all Gulistan lines.

Ray W. Griffin has been named plant manager of the Lupton City, Tenn., chemical fibers division of Dixie Mercerizing Co.

Arthur B. Edge, III, assistant superintendent, has been promoted to superintendent of the Hillside plant of Callaway Mills Co., LaGrange, Ga. **Carl A. Buchanan** has assumed duties as office assistant of Hillside sales. **John Tice** has become assistant superintendent of finishing. **Kenneth Nelms** has been promoted to quality control supervisor. * * * **Colville Harrell** recently joined the company as industrial engineer. * * * **Dayton Smith,** formerly of the Milstead plant, has been transferred to the Unity plant. * * * **William P. Ironside** has joined the engineering staff as textile technologist. * * * **Thomas L. Arnett,** chief product development engineer of the research and development division, has retired. * * * **James P. "Jim" Trotter** has been named sales manager, area and scatter rugs, Calumet plant. Mr. Trotter will be headquartered in New York. ***Joe R. Walters, Jr.,** has been promoted to sales assistant at the Hillside plant. **Robert L. "Bobby" Waugh,** formerly plant engineer, has been appointed office assistant.** **Donald L. Cole** has been named southeastern sales representative for the Unity plant products.

James A. Lindsey was recently appointed to the newly created position of technical supervisor for the Trion (Ga.) division of Riegel Textile Corp. * * * At the Ware Shoals (S. C.) division, **Bill Winecoff** has been promoted to senior industrial engineer.

Dr. Joel K. Lindberg, formerly associate director of the Swedish In-

Mr. Griffin
Dixie Mercerizing

Mr. Briggs
A. & M. Karagheusian

Mr. Robinson
A. & M. Karagheusian

Mr. Buchanan
Callaway Mills

Mr. Edge
Callaway Mills

Mr. Tice
Callaway Mills

Mr. Trotter
Callaway Mills

Mr. Cole
Callaway Mills

stitute for Textile Research in Gothenberg, has joined the staff of the textile research center in North Carolina State College's School of Textiles. Dr. Lindberg will be an adviser in developing the newly-established program of basic textile research.

William L. Handy has accepted a position with Glenoit Mills, Inc. Mr. Handy will assist S. M. Kinzinger, vice-president and plant manager, in production and expansion of the Janesville, Wis., and Tarboro, N. C., mills.

Wesley F. Kern has been appointed vice-president of Bossong Hosiery Mills, Inc., Asheboro, N. C. **Edward J. Muller** has been named treasurer.

Henry Watermeir has accepted the position of overseer of weaving at the Texas Department of Corrections, Huntsville, Texas. **Alfred Ballinger** has been appointed overseer of spinning.

Dr. Ruby K. Worner, textile technologist and head of product evaluation investigations of the U. S. Department of Agriculture's Southern Utilization research and development division, has been chosen for a Fulbright grant. Dr. Worner will be a lecturer and consultant in textile technology and research, with special reference to cotton, at the University of Alexandria, Egypt, for the academic year 1960-61.

James Gribben, III, has accepted the position as director of public relations for the Tufted Textile Manufacturers Association, headquartered in Dalton, Ga. Mr. Gribben will serve as assistant to R. E. Hamilton, executive vice-president of the Association, and will edit the TTMA directory, as well as develop publications for the industry and the public.

Members of the Joanna Manufacturers Council recently honored **W. K. Waits,** assistant superintendent of Joanna (S. C.) Cotton Mills Co., at a dinner. The occasion was Mr. Waits' retirement after 61 years in textiles. A silver bowl, appropriately engraved, was presented to the honoree.

M. E. Sibley, formerly associated with Burlington Industries, Inc., has been named executive vice-president of manufacturing and division manager of Peerless Woolen Mills, Rossville, Ga.

Royal Little has retired as chairman of the board of Textron, Inc., but will continue as chairman of the executive committee. **Rupert C. Thompson, Jr.,** formerly president, has been elected chairman of the board of directors and chief executive officer and **George William Miller,** formerly vice-president and assistant to the president, has been appointed president and chief administrative officer.

Dolan B. Frye has been promoted to general superintendent for mill No. 6 of Wiscassett Mills Co. **John M. Morrow** has been elevated to superintendent, and **Charles R. Marshall** has been named assistant superintendent. * * * **Thomas M. Denning,** general superintendent, has retired.

Frederick A. McAlpine, vice-president and secretary of Sayles Finishing Plants, Inc., Saylesville, R. I., has retired. **Edward R. Coddington,** vice-president and treasurer, has been named secretary succeeding Mr. McAlpine.

Joe Tollison has been named summer athletic and recreation director of the Easley, S. C., plant of Woodside Mills.

Rodney Graham, formerly plant superintendent for Santee Print Works, has accepted the presidency of Printed Fabrics Corp., Carrollton, Ga., a division of Meade & Montague.

Alfred New, treasurer of Gaffney Mfg. Co., has been named a vice-president of Monarch Mills, Inc., and

Mr. Ironside
Callaway Mills

Mr. Waugh
Callaway Mills

Mr. Walters
Callaway Mills

Mr. Nelms
Callaway Mills

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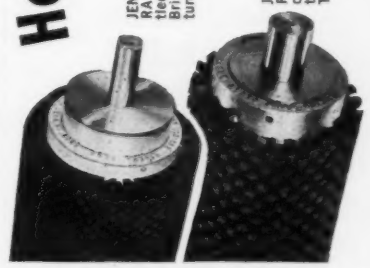

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PERSONAL NOTES

(from page 215)

general manager of the Lockhart (S. C.) plant. **I. S. Pitts, Jr.,** manager of the Monarch plant, Union, S. C., has been appointed vice-president.

Roland E. Myers has been named assistant superintendent of the yarn manufacturing division of the P. H. Hanes Knitting Co., Winston-Salem, N. C.

William McElroy has been promoted to foreman of the engraving shop of Cranston (R. I.) Print Works.

David E. Arthur has assumed duties as manager of the Lawrence, Mass., plant of Malden Mills.

T. Max Watson, president and manager of Sterling Hosiery Mills, Inc., Spindale, N. C., has resigned and disposed of his interest in the corporation. **Allen H. Painter,** treasurer, has been named president, succeeding Mr. Watson.

George F. Watson has been named general superintendent of the grey mills division of Fulton Cotton Mills, Atlanta, Ga.

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Send Us Your Problems:
We Will Cooperate
— To Save You Money.
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SERVING NEW ENGLAND SINCE 1917

Coy H. Hamilton has been named assistant manager of the Albany, Ga., mill of Coats & Clark, Inc.

Jack Leach has been appointed to the newly created position of technical director of Burlington Industrial Fabrics Co., a division of Burlington Industries, Inc. Mr. Leach will be in charge of all research and development activities within the product development department.

G. A. M. Butterworth, Rohit M. Desai, C. Richard Desper, and **Miss Elizabeth Cilley** have been named to the research staff of Fabric Research Laboratories, Inc.

Julian M. Rivers has been named comptroller of J. P. Stevens & Co., Inc., succeeding W. T. Stockton, who has resigned.

The National Safety Council has named **Robert G. Belknap** staff representative for its rubber and textile sections. Mr. Belknap was formerly associated with Bemis Bro. Bag Co.

R. G. Fox, Jr., has been promoted to the newly created post of general manager of distribution for The American Thread Co., Inc.

OBITUARIES

Harold M. Chase, 88, retired research chief for Dan River Mills, Inc., Danville, Va.

George M. (Spud) Coker, superintendent of Wehadkee Yarn Mills, Talladega, Ala.

Miles M. Comer, 72, retired sales agent for Saco-Lowell Shops, Atlanta, Ga.

Harvey Eastman, 52, formerly manager of the Marion, N. C., plant of The American Thread Co., Inc.

A. Stanley Llewelyn, 73, retired superintendent of Wateree Mill, Camden, S. C.

Joseph Pauker, 73, former owner of Byrne-Ross Knitting Mills, Kingston, N. Y.

Louis Rosen, 78, chairman of the board of directors of Northwick Mills, Dalton, Ga.

James M. Scott, 50, general plant manager and treasurer of Scott Testers, Inc., Providence, R. I.

Felix A. Tagliabue, 61, president and sole owner of Palisades Dyeing Corp., Peacedale, R. I.

E. C. Tobias, 91, former president of Woolrich Woolen Mills, Williamsport, Pa.

Harry Wexler, 75, president and cofounder of Wexler Knitting Mills, Philadelphia, Pa.

Frank Marshall Wilcox, 83, retired founder and president of Wilcox Chenilles, Inc., Dalton, Ga.

MILL NOTES

Stanley Granat and Irwin Bloch have purchased the cotton plaid mill and dye house of the former Newnan (Ga.) Mills. Designated **Newnan Mills, Inc.,** the firm will continue the manufacture of combed plied colored yarn box loom fabric. Bay City Fabrics, Inc., New York, N. Y., a newly organized firm, has been appointed selling agent for the mill.

A new full-fashioned hosiery mill has begun operations in Stonewall, Ontario. The mill, financed jointly by local capital and the **Lincoln Hosiery Mills, Ltd.,** of St. Catherines, Ont., is equipped with four f-f hosiery machines and seven seaming machines.

The coated fabrics plant of **Plymouth Rubber Co.,** Rockland, Mass., has been moved into a new building adjacent to the main plant in Canton, Mass. The 200,000 sq ft facility is almost double the previous capacity for manufacturing.

Caron Spinning Co., Rochelle, Ill., recently opened a facility in Amsterdam, Holland, for the manufacture of textiles.

Cannon Mills Co. has started construction of a 43,000 sq ft building to house its yarn dyeing facilities at Kannapolis, N. C. The new structure is located north of the present bleaching building.

A new corporation, **Topp Fabric, Inc.,** has been formed in Waldwick, N. J. to process and finish textiles. Ira Buda Jacobs, Nathan Baum, and Abraham Baum are the incorporators of the firm.

Bothwell Mills, Newton, N. C., has completed installation of 170 additional knitting machines which will more than double the firm's capacity for producing socks and anklets.

A modern, one-story factory building, containing 60,000 sq ft of space, is being constructed by **Emple Knitting Mills,** Bangor, Me. New and additional knitting equipment, and conveyor systems will be installed in

the new plant, which is expected to be completed in December.

The new Martha Baum mill, Rockingham, N. C., has been opened by **J. P. Stevens & Co., Inc.** Worsteds will be made for the Forstmann and Hockanum lines. The plant now has 64 looms and has space for approximately as many more.

C. C. Hill Hosiery Mills, Inc., Thomasville, N. C., has increased production 25 per cent with the completion of a three-story addition to its plant. Much of the additional space is being used for storage and shipping.

The reservoir space for the storage of filtered water has been more than doubled at the **Carlisle (S. C.) Finishing Plant,** a division of Cone Mills Corp.

Genesco has acquired Kingsboro Mills, Inc., Chattanooga, Tenn., through an exchange of stock. No change in executive personnel will be made.

The Lippitt Worsted Mill plant in Woonsocket, R. I., has been re-opened by **Novtex Yarns, Inc.** Hector Briere, is president and asst. treasurer.

Employees of the grey mill and finishing plant, Trion, Ga., division of **Riegel Textile Corp.,** recently completed one million man-hours without a disabling injury. Awards were presented to the cloth warehouse employees acknowledging two years worked without a disabling injury.

M. Lowenstein & Sons, Inc., has announced an expansion and modernization program for the Covington, Ga., mills. The new facilities will be for man-made fibers and is expected to be completed by the end of the year.***The firm has announced the formation of Clark-Schwebel Fiber Glass Corp., to engage in the weaving, finishing, and marketing of industrial and decorative glass fabrics. Clark-Schwebel will have executive and sales offices in New York and will function as an independent affiliate of Lowenstein.

An expansion program for the Norris, Liberty and Haynsworth plants of **Woodside Mills** has been announced. At the Norris plant 253 looms and 12 new spinning frames will be installed. Approximately 15,000 sq ft of floor space is being added for the offices and canteen. The picker room will be relocated, and the carding, spinning, cloth, and yarn preparation rooms will be air conditioned.***Construction is underway at the Liberty plant where a second floor is being added to the No. 2 plant. Additional cards, drawing, combers, and roving frames will be installed, together with 13,000 more spindles.***At the Haynsworth plant, 190 new looms and winders on all looms is a part of the program.

A new 15,000 sq ft finishing plant is being constructed in Lincolnton, N. C., by **Meyer Mills.** When completed, it is expected that approximately 125 people will be employed.

The **Bigelow-Sanford Carpet Co.,** recently presented to the Clemson (S. C.) College School of Textiles a 27-inch velvet carpet loom, and J. D. Hollingsworth on Wheels installed a Hollingsworth flatless conversion unit on a cotton card.

Rockingham (N. C.) Mills, Inc. has leased part of the old Safie Mills building and has started production in the weaving, dyeing, and finishing of pile fabrics for furniture upholstery.

Employees from three departments of the Clover, S. C. mills of **The American Thread Co., Inc.,** were honored recently for having amassed 3,404,284 manhours without a lost-time accident.

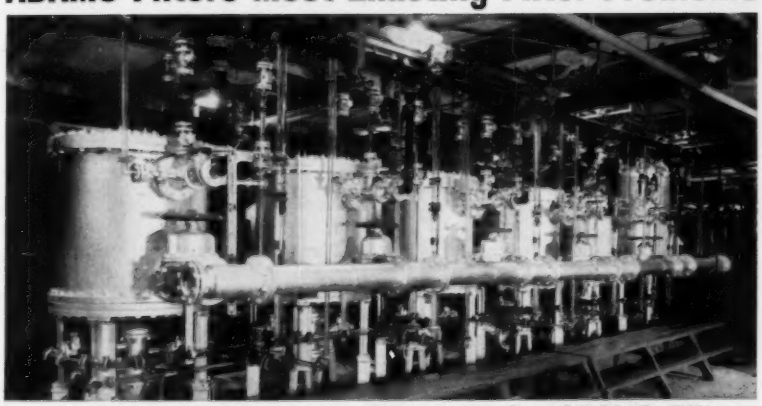
Hanes Hosiery Mills Co. has announced plans to construct a mill in Toronto during 1961 to manufacture seamless stockings. The initial unit will cost 1 million dollars and will be staffed by Canadians who will be trained at the Winston-Salem plants.

A number of new wide-fabric looms have been ordered by the **Bates Manufacturing Co.** and will be installed at the Hill division in Lewiston, Maine.

All dye machines have been completely modernized and new and larger machines are being installed at **Cloverdale Dye Works, Inc.,** a subsidiary of Highland Cotton Mills, Inc. The winding rooms have been equipped with the latest winding equipment and rapid drying machines have been installed.

General Knitting Mills, Inc., Monroe, N. C., has announced the acquisition of land for construction of addi-

ADAMS Filters Meet Exacting Filter Problems



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The above Adams installation involves use of inert Poro-Stone elements, rubber-lined filters, and Pyrex pipe to prevent product contamination. Complete removal of colloidal iron compounds from acid solution is dramatically illustrated by dark input and crystal clear output — Pyrex pipe. Three subsequent orders were received from this satisfied customer.

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MILL NOTES

(from page 217)

tional buildings for new knitting facilities and storage. When completed, the firm will add 40 employees to the payroll.

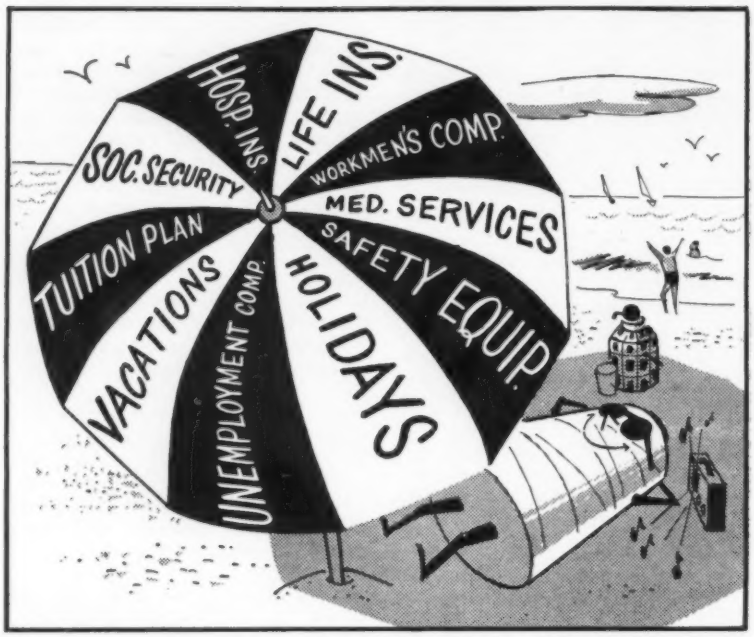
Employees of **Lydia Cotton Mills,** Clinton, N. C., and members of their families were honored recently for having completed two million manhours without a disabling injury.

Chadbourn Gotham, Inc., and **Davenport Hosiery Mills** have merged. The latter firm will operate as a separate division of the parent firm.

Williams Hosiery Mill, Robbins, N. C., has announced the installation of thirty new 400-needle machines.

An 11,000 sq ft addition will be constructed by **Kayby Hosiery Mill,** Thomasville, N. C. The new facility will be used for an extension of the children's knitwear section.

A J. S. Crane & Co. two-frame knitting machine has been presented to the Old Slater Mill Museum by **Lebanon Knitting Mills, Inc.** The machine is the first of the powered machines in the Museum's collection to be put into actual operation.



This cartoon in a pre-vacation issue of the employee publication of **The American Thread Co.** reminded readers of many of the benefits of working for the firm. Vacation pay checks valued at $368,000 were presented to eligible employees prior to the annual summer shutdown of the company's mills July 2 - 10.

Butte Knitting Mill, Spartanburg, S. C., a division of Jonathan Logan of New York, manufacturers of women's apparel, expects to double employment by the end of the year.

A new firm, **Burlington, (N. C.) Knitwear, Inc.,** has begun operations at 1648 West Webb Ave. James A. Chappell is president and general manager. The firm is manufacturing full-fashioned hosiery, domestics, and novelty items.

J. P. Stevens & Co., Inc., Greenville, S. C., through Black Hawk Corp., a wholly owned subsidiary, is erecting a $1 million warehouse building.

Small Bros Mfg. Co., Fall River, Mass., has ceased operations.

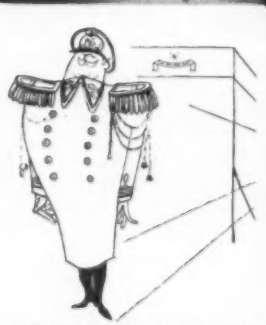
Line-Made Hosiery Mills, Hickory, N. C., has announced plans for a 2300 sq ft addition to the present plant to aleviate crowded conditions.

The Pepperell Manufacturing Co. recently presented to the Floyd County board of education the deed to Pepperell's Junior High School in Lindale, Ga. The gift was part of the program the company has to help provide the Pepperell schools with buildings and adequate land for school needs.

Brandeis University has received a $200,000 fund from Martin Weiner, president of **Texstyle Corp.** and **Martin Weiner Corp.,** to subsidize a program that will bring outstanding men and women to the liberal arts college in a continuing lecture series beginning next fall.

Fieldcrest Foundation, a non-profit organization for the promotion of religious, charitable, scientific, literary, and educational causes has been announced by **Fieldcrest Mills, Inc.** Income for the foundation will be from gifts by the mills, and from profits of the employee's store and the canteen operations. The first project of the foundation was the establishment of Fieldcrest scholarships for students who are employees or children of employees of the company. The foundation has also appropriated $5500 which will be used to match contributions to improve playground and recreational facilities for children in Leaksville-Spray-Draper.

W. G. Holder, a former partner in Kenworth Hosiery Mills, Hickory, N. C., has acquired all interest in the mill and has changed the name to **Holder Hosiery Mills.**



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SUPPLIER NOTES

Pictured is the new home of **Watson-Williams Mfg. Co.** Located in Pinebluff, N. C., the steel and concrete structure contains 36,000 sq ft of floor space.

Livingston and Haven, Inc., has been appointed a distributor for Crown air system regulators, filters and lubricators, products of the Hannifin Co. division of Parker-Hannifin Corp.

John M. Washburn, Jr., has been elected secretary and a director of **The Merrow Machine Co.**

Marion Industries, Inc., is the corporate name of the new subsidiary of **Draper Corp.** A building of approximately 50,000 sq ft will be constructed near Marion, S. C., to house the new firm which will manufacture certain wood and metal products for the industry.

C. K. Dunlap, a vice-president of **Sonoco Products Co.,** has retired. Mr. Dunlap designed and patented more than 40 machines used in the conversion of paper to cones, and tubes and cores. He was also responsible for many innovations in the converted paper industry, including the now famous 3°30′ cone used by the textile industry for winding synthetic yarns.

Herbert T. Florence has been elected president and general manager of **The Cleveland Crane & Engineering Co.,** succeeding Charles F. Safreed, who has been made chairman of the board of directors.

Pennsalt Chemicals Corp. has announced the completion of the $6 million modernization program at the Wyandotte, Mich., chlorine-caustic plant.

A new branch office and warehouse has been established at 1845 Marietta Blvd., N. W., Atlanta, Ga., by **Lincoln Engineering Co.** J. P. O'Donnell will direct the branch operation.

The Terrell Machine Co., Inc., has been appointed exclusive sales agents for the fiberglass re-inforced plastics made by **Benray, Inc.** The wide range of products will include doffing boxes, slasher hoods, slasher ducts, conditioning boxes, and other items where there are corrosion problems.

New Castle, Delaware, has been selected by **AviSun Corp.** as the site of its new multi-million pound-per-year polypropylene plant. The new facility will be adjacent to the present film plant and fiber plant.

The administrative and sales headquarters of **Becco Chemical Division** of Food Machinery and Chemical Corp. have been moved to 161 East 42nd St., New York City.

Thomas M. Ripley, technical service representative for the fibers division of **American Cyanamid Co.,** has been transferred from New York to the Charlotte, N. C., office. * * * I. Clifford Smith has been named a sales representative in the southern sales district. Mr. Smith will cover the area south of Charlotte, N. C.

The expansion program of **Bearings, Inc.,** within the past year, has included the acquisition of Neima Bearings Co. of St. Louis with branches at Little Rock, Ark., Mem-

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Nihon Spindle is a most influential manufacturer of spindles and its related parts in Japan. Its products are uniformly high in quality. Not only widely used in Japan but being exported to various parts of the world such as the United States, and Southeast Asian and South American nations.

Main Products

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Spi-Ra-Clean (Automatic Cleaning and Lubricating Device for Spindles)
Pneumaniez (Suction Clear Systems)

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SUPPLIER NOTES

(from page 219)

phis, Tenn., St. Louis, and East St. Louis, Ill. New branches have also been established in Roanoke, Va., Newark, N. J., and Niagara Falls, N. Y.

Procter & Gamble Co. has announced the appointment of J. B. Crowe as manager of the industrial specialties sales division. H. F. Nebel has been named manager of the newly created specialty products department, and J. W. Burch has been appointed zone manager of the textile finishes section, succeeding Mr. Nebel.

A modern chemical plant is being constructed in Simpsonville, S. C., by **Metro-Atlantic, Inc.**

Robert V. Corning has been named manager of marketing for the **General Electric Co.'s** large lamp department. Mr. Corning succeeds Ralph H. Humbert, who will remain with the department as a consultant.

Bob Rothman, formerly sales manager of **Easley Textile Co.,** has resigned his position with the firm and is now a manufacturers' representative for lace, braid, Schiffli embroidery, trimming and allied lines in the southeast area. Mr. Rothman is headquartered in Greenville, S. C.

Mr. Rankin
American Enka

J. L. Hunter
American Enka

Mr. Conze
Celanese Corp.

Mr. Brooks
Celanese Corp.

Douglas W. Smith, Joseph L. Hunter, and Wiley T. Rankin have been named sales representatives for **American Enka Corp.** Robert C. Hunter has been appointed technical representative. Mr. Smith and Robert C. Hunter have been assigned to the New York district sales office. Mr. Rankin has been assigned to the Providence district sales office, and Joseph L. Hunter to the district sales office in Chattanooga.

Celanese Plastic Products Co. and Celanese Polychem Co. are the two new divisions which supersede the former plastics division of **Celanese Corp. of America.** John W. Brooks has been assigned directional responsibility over the fibers and plastic products companies, and Richard W. KixMiller has assumed like responsibility over the chemical and polychem companies. Newly appointed presidents are: Peter H. Conze, Celanese Fibers Co.; William P. Orr, Celanese Polychem Co.; James H. Worth, Celanese Chemical Co.; David Taylor, Celanese Plastic Products Co. * * * Louis F. Laun has been appointed vice-president and director of marketing of Celanese Fibers Co.

James H. W. Conklin has been appointed general sales manager for **Stanley Steel Strapping,** a division of The Stanley Works.

The marketing organization for **Tennessee Eastman Co.** and **Texas Eastman Co.,** has been expanded through a recently formed International division. The new Eastman marketing division will be responsible for the sales and service in all foreign countries, of fibers, chemicals, and plastics manufactured by the two firms. Eastman Chemical Products, Inc., will continue as sales agent in the U. S. and Canada.

Putnam Chemical Corp. has announced the appointment of Milton Charatz as technical demonstrator for the mid-Atlantic territory.

J. Edward Dempsey has been named assistant manager of the New York consulting service for dyeing and finishing division of **E. I. du Pont de Nemours & Co., Inc.** F. L. Shackelford, Jr., has been appointed assistant manager of the Chicago district sales office, succeeding Mr. Dempsey.

Manton-Gaulin Mfg. Co., Inc., has announced the appointment of **Hayes Textiles, Inc.,** as exclusive sales representatives to the textile manufacturing and finishing plants for the states of Virginia, N. Carolina, S. Carolina, Georgia, Tennessee, Ala-

from Operation to Operation . . .

Mount Hope Poteyes are constructed of long-lasting, smooth stainless steel which reduces friction, safely handles the most delicate fabric. Designed to function efficiently at high speeds, they minimize pull and tension — take heavy loads perfectly.

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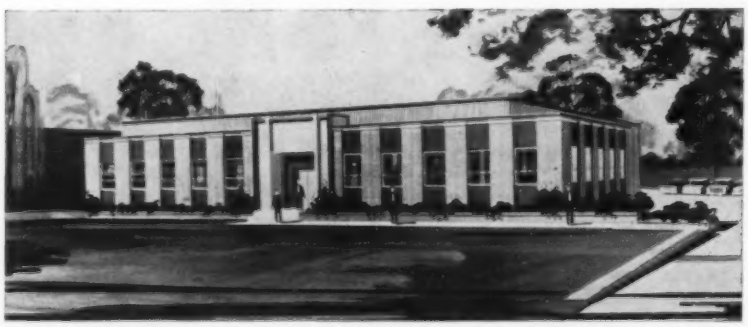

The Foxboro Co. has moved its seven-state sales and service headquarters to the newly constructed building at 3393 Malone Dr., Chamblee, Ga. In addition to housing the regional headquarters, the new building provides offices for the staff of the Atlanta branch and a complete service and repair shop.

DURANT

MODEL "T" LINEAL COUNTER

furnished with **MOUNTING BRACKET** *for* **CONSTANT ACCURACY**

and perfect alignment of measuring wheels

Even at high speeds, the Durant Model "T" lineal measuring machine will accurately measure fabrics in feet, yards, or yards and 1/8ths. Two wide, 18-inch measuring wheels assure accurate measuring and longer life. The hinged and swiveled bracket allows wheels to ride perfectly flat on the material at all times.

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- **Sturdy, Long Life Instrument —** All components of the Durant counter are of the highest grade materials to assure years of accurate service under the hardest working conditions. The heavy duty stainless steel 5/16" drive shaft is mounted on high grade ball bearings; large measuring wheels can be cast iron or aluminum, knurled or rubber rimmed; all parts of the counting mechanism are of the strongest, long wearing materials.

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REPRESENTATIVES IN ALL PRINCIPAL CITIES

bama, Mississippi, and Texas. John E. R. Hayes and Lawson Hayes are sales representatives.

T. B. Wood's Sons Co. has moved into its new southeastern regional warehouse and office building at 1736 De Foor Place, N. W., Atlanta, Ga. The new warehouse is under the jurisdiction of Joe Seawell, Jr., regional sales manager of the south- R. Hayes and Lawson Hayes are sales representatives.

Joe E. Spearman has been appointed technical representative for the textile chemical division of the **Jordan Mfg. Co.** Mr. Spearman will serve the southern and southeast areas of the U. S.

Virgil Collette, formerly sales representative for Piedmont Machine Shop, has joined **Dixon Corp.** as a steel roll salesman. Mr. Collette will call on the spinning trade in North and South Carolina * * * The firm has announced the sale of the Rhode Island facilities. Tentative plans call to move all textile operations to the south within the next two years. A sales office willl be maintained in Rhode Island to serve New England and Canadian customers. The plastics division will remain in its present location.

The Rodney Hunt Machine Co. has announced the appointment of Warren Ramsdell as sales engineer in charge of the service and repair department of the textile machinery division. * * * H. G. "Tommy"

Mr. Collette
Dixon Corp.

Mr. Spearman
Jordan Mfg.

Lawson Hayes

John Hayes
Hayes Textiles

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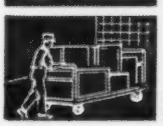

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IMPROVED METHODS OF PREPARING TEXTILE PRINTING COLORS

An important technical bulletin has been prepared on this subject, based on actual plant operations developed over a period of many years. It describes basic methods and procedures in detail and shows how significant advantages are now being realized in the preparation of oil-in-water and water-in-oil emulsions through the use of Morehouse Mills and Cowles Dissolvers.

In both types of operations these advantages include—Faster processing of larger batches with thorough distribution of components • Greater volume-per-hour than other equipment • Full control of quality and tints • Important savings in space, operating and maintenance costs • Greater versatility—ability to handle practically any type of material in practically any viscosity range—Dry Pigments, Pulp Colors, Soluble Resins, Dispersable Pastes and Emulsions • Ease of cleaning—rapid change-over without contamination.

Specific advantages in "water-in-oil" method—Rapid grinding of color pigments in resin solutions • Ability to handle all types of such bases • Fast, efficient dispersion of "cut clear" materials • Perfect dispersion in large batches.

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COWLES DISSOLVERS
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REPRESENTATIVES IN PRINCIPAL CITIES
CONVENIENT LEASE AND TIME-PAYMENT PLANS

SUPPLIER NOTES

(from page 221)

Thompson has been named a textile machinery sales representative for the Massachusetts, Connecticut, Rhode Island, New York, New Jersey, and Pennsylvania territory.

Morton Machine Works, Inc., has announced the appointment of Parrott & Ballentine as southern sales agent for their complete line of package, beam, and raw stock dyeing and drying equipment. Harry C. Jackson,

Mr. Ballentine

Mr. Parrott

president, in making the announcement stated that the appointment of Parrott & Ballentine as their agents is part of the program of rendering the greatest possible service to the dyeing and finishing industries.

Henry H. Ogden, formerly executive vice-president of the Mead Atlanta Paper Co., has been named president of **R. S. Kerr & Co.,** representatives of Yale Materials Handling Division of The Yale & Towne Mfg. Co.

Royden Walters, executive vice-president and general manager of **Saco-Lowell Shops,** has been elected to the board of directors. * * * The International division has moved to Easley, S. C. Improved coordination between the division and the manufacturing plants in the Carolinas, which will result in improved service to customers, was given as the reason

Mr. Heard

for the move. M. Earl Heard, Jr., has been promoted to assistant to the vice-president of the division.

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GREENVILLE, S.C.

ADVERTISER'S INDEX

A

Adams Co., Inc., R. P. 217
Akron Spool & Mfg. Co. ..... *
Aldrich Machine Works 27
Allen Company, Inc. 16
Allen Beam Co. 204
Allen-Bradley Co. 56
Allen Sons' Co. Div., Wm. .... *
Allied Chemical Corp.
Corporate Div. 157, 158, 159, 160, 161, 162, 163, 164
Allied Chemical Corp.
National Aniline Div., Fiber Marketing Dept. 48
National Aniline Div. ..... *
Nitrogen Division ..... *
Semet Solvay Petro-Chemicals Div. ..... *
Solvay Process Div. ..... *
Allis Chalmers Mfg. Co. ..... *
Allis Company, Louis ..... *
American Air Filter Co. 74
American Cyanamid Co., Fibers Division ..... *
American Enka Corp. ..... *
American Gas Association 70
American Lava Corp. ..... *
American Moistening Co. 96
American MonoRail Co., Inc. Conveyor Division ..... *
American Steel & Wire 170, 171
American Viscose Corp.
Fibers Division ..... *
Industrial Packaging Dept. 65
Anderson Chemical Co., Inc. .... *
Anheuser-Busch, Incorporated ..... *
Antara Chemicals, General Aniline & Film Corp. 8
Armstrong Cork Co. 14, 15
Arnold, Hoffman & Co. ..... *

B

Bahnson Co. 22
Barber-Colman Co. (Textile Div.) 90
Batson Co., Louis P. ..... *
Becco Chemical Division 2
Bemis Bro. Bag Co. ..... *
Bendix Aviation Corp. ..... *
Benjamin Booth Co. 10
Bijur Lubricating Corp. 6
Borne Chemical Co. 28
Brook Motor Corp. ..... *
Buffalo Forge Co. 35
Buffalo Pumps, Inc. ..... *
Butterworth & Sons Co., H. W. ..... *

C

Carbic Hoechst Corp. 51, 52
Carolina Fiberglass Products Co. 206
Carrier Corporation ..... *
Carter Traveler Co., Div. A. B. Carter, Inc. ..... *
Celanese Corp. of America .... *
Central Motor Lines, Inc. .... *
Cen-Tennial Cotton Gin Co. .. *
Chandler Machine Co. ..... *
Chemstrand Corporation (Acrilan) ..... *
Classified Ads 222
Cleveland Tramrail Division, The Cleveland Crane & Engr. Co. 88
Clinton Corn Processing Co. .. *
Clipper Belt Lacer Co. ..... *
Coats & Clark's Sales Corp. .. *
Cocker Mach. & Fdry. Co. 152
Columbia-Geneva Steel 170, 171
Corn Products Sales Co. ..... *
Cosa Corporation 20
Cotton McCauley & Co., Inc. .. *
Courtaulds, Ltd. ..... *
Crompton & Knowles Corp. .. *
Curiator Corp., Textile Div. .... *
Curtis & Marble Machine Co. ..... *
Custom Scientific Instruments, Inc. ..... *

D

Darnell Corp., Ltd. 221
Dary Ring Traveler Co. 203
Davis & Furber Mach. Co. .... *
Dayco Textile Products Co. ..... *
Delta Air Lines ..... *
Diehl Mfg. Co. .....Second Cover
Dixie Bearings, Inc. 62
Dixon Corporation 50A
Dodge Mfg. Corp. 156
Dommerich & Co., L. F. ..... *
Draper Corporation 1
Dronsfield Bros. Ltd. ..... *
Dryden-East Hotel 218
Duesberg-Bosson of America 202
Du Pont de Nemours & Co., Inc., E. I. (Electro-chemicals Dept.) 82, 83
Du Pont de Nemours & Co., Inc., E I. (Finishes Div.) ..... *
Du Pont de Nemours & Co., Inc., E. I. (Textile Fibers Div.) 94, 95
Durant Mfg. Co. 221
Duverre, Inc. 206

E

Eastern Engineering Co. 206
Eastman Chemical Products, Inc. Chemicals Div. 75
Fibers Div ..... *
Eastman Machine Co. 202
Eaton Mfg. Co. Dynamatic Div. 37
Esso Standard, Division of Humble Oil & Refining Co. 66
Exact Weight Scale Co. ..... *
Extremultus, Inc. ..... *

F

Fabrionics Corp. ..... *
Fafnir Bearing Co. ..... *
Fancourt Co., W. F. 180
Faultless Caster Corp. ..... *
Ferguson Gear Co. ..... *
Fiber Controls Corp. 26
Fife Mfg. Co. ..... *
Firestone Tire & Rubber Co. *
Fisher Mfg. Co., Inc. ..... *
Food Machinery & Chemical Corp., Chlor-Alkali Div. .... *
Foote Bros. Gear and Machine Corp. 31
Foster Machine Co. 76
Foxboro Company 174
Franklin Process Co. ..... *

G

Gardner Denver Co. ..... *
Gates Rubber Co. ..... *
Gaylord Container Corp. 30
Geigy Chemical Corp. Geigy Dyestuffs Div. 71
General Dyestuff Corp. ..... *
General Radio Co. 63
Gessner Co., David 192
Goodrich Chemical Co., B. F. 54
Goodyear Tire & Rubber Co., Inc., Chemical Prod. 5, 77
GPE Controls, Inc. ..... *
Graton & Knight Co. ..... *
Gray Company, Inc. 200
Guider Specialty Co. ..... *
Gulf Oil Corp. 38, 39

H

Harshaw Chemical Co. 36
Heller & Co., Walter E. ..... *
Herbert Products, Inc. ..... *
Hercules Powder Company 32
Herr Mfg. Co. 59
Hotel Dryden-East 218
Howard Bros. Mfg. Co. ..... *
Hubinger Co. 92
Hunter Machine Co., James... *

I

Ideal Industries, Inc. ..... *
Ideal Machine Shops ..... *
Industrial Packaging Dept. .... *
Industrial Dryer Corp. ..... *
Interchemical Corp., Color & Chemicals Div. 72, 73
International Salt Co. ..... *

J

Jenkins Metals Shops, Inc. 197
Jenkins' Sons, M. W. 215
Johnson Bronze Co. ..... *
Johnson Corp. 200
Jungfrau, Inc. 44

K

Keever Starch Company 186
Kennett Materials Handling Division, National Vulcanized Fibre Co. ..... *
Kidde Textile Mchy. Corp.... *
Klauder Weldon Giles Machine Co. ..... *
Koppers Company, Inc., Chemicals & Dyestuffs Div. ..... *

L

Lane & Bros., Inc., W. T. ..... *
Laurel Soap Mfg. Co. 68
Leesona Corporation 46, 47
Lestershire Spool Division National Vulcanized Fibre Co. ..... *
Lincoln Engineering Co. ..... *
Link-Belt Co. ..... *
Livermore Corp., H. F. ..... *
Livingston & Haven, Inc. ..... *
Lockwood Greene Engineers Inc. ..... *
Loper Co., Ralph E. 204
Lovejoy Flexible Coupling Co. ..... *
Ludell Mfg. Co. ..... *
Lukenheimer Co. ..... *

M

Maguire & Co., Inc., John P. 198
Marlin-Rockwell Corp. ..... *
Marshall & Williams Corp. .... *
McBride Co., Inc., Edward J. *
McCandless Corp. 52A
McDonough Power Equipment, Inc. 204
Meadows Mfg. Co. 204
Merrow Machine Co. ..... *
Metro-Atlantic, Inc. 79
Mill Devices Co., Div. A. B. Carter, Inc. ..... *
Miller Corporation, Harry 11
Minneapolis-Honeywell Regulator Co., Industrial Div. ..... *
Minnesota Mining & Mfg. Co. 50
Minnesota Paints, Inc. ..... *
Moisture Register Co. 212
Monsanto Chemical Co. ..... *
Morehouse-Cowles, Inc. 222
Moretex Chemical Co. 199
Morton Machine Works 18
Morton Salt Co. ..... *
Mount Hope Machinery Co. 201, 220

N

National Drying Machinery Co. ..... *
National Ring Traveler Co. .... *
National Starch Prod., Inc. 29
National Tube 170, 171
National Vulcanized Fibre Co. ..... *
Nemo Industries, Inc. ..... *
New York & New Jersey Lubricant Co. ..... *
Nihon Spindle Mfg. Co. 219
Nopco Chemical Co. 58
North American Mfg. Co. ..... *

O

Oakite Products, Inc. ..... *

P

Pabst Brewing Co. ..... *
Parks-Cramer Co. ..... *
Patterson-Kelley Co., Inc. .... *
Penick & Ford, Ltd., Inc. 23
Pennsalt Chemicals Corp. ..... *
Perfecting Service Company *
Perkins & Sons, Inc., B. F.... *
Pneumafil Corp. ..... *
Portland Co., The ..... *
Proctor & Schwartz, Inc. ..... *
Putnam Chemical Corp. 17

R

Radio Corp. of America ..... *
Red-Ray Manufacturing Co., Inc. 198
Reiner, Inc., Robert ..... *
Reliance Elec. & Engr. Co. 33
Rhoads & Sons, J. E. 78
Richards-Wilcox Mfg. Co. ..... *
Rieter Machine Works, Ltd..... 49
Robbins & Myers, Inc. 53
Robert & Co., Associates, Inc. .....Front Cover
Roberts Co. 7
Rohm & Haas Company ..... *
Royce Chemical Co. Back Cover

S

Saco-Lowell Shops ..Third Cover
SACM ..... *
Sandoz, Inc. 41, 42
Sargent's Sons Corp., C. G. .... *
Saurer, S. A., Adolph ..... *
Scheer Tumico Co. ..... *
Scholler Brothers, Inc. 81
Service Recorder Co., The .... *
Seydel-Woolley & Co. 45
Shell Chemical Corp. 69
Signode Steel Strapping Co.... *
Simco Company ..... *
Sims Metal Works 100
Sinclair Refining Co., Inc..... *
Singer Mfg. Co. 40
Sirrine & Co., J. E. ..... *
SKF Industries, Inc. 148
Sonoco Products Co. 80
Sou-Tex Chemical Co., Inc. 34
Southern Airways Co. 86
Southern Machinery Co. ..... *
Southern Shuttles Div. 57
Southern Sizing Co. 205
Southern States Equip. Corp. 13
Southern Textile Works 222
Spraying Systems Co. 205
Square D Company 19
Staley Mfg. Co., A. E. ..... *
Standard Chemical Prod., Inc. 55
Standard Oil Co. (Kentucky) ..... *
Star Paper Tube, Inc. ..... *
Steel Heddle Mfg. Co 57
Stover Co., Charles G. 222
Stowe-Woodward, Inc. 21

T

Taylor Instrument Companies 64
Tennant Co., G. H. 12
Tennessee Coal & Iron 170, 171
Tennessee Corp. 68
Terrell Mach. Co., Inc. 84
Texaco, Inc. ..... *
Textile Banking Co. 98
Textile Hall Corporation ..... *
Textile Industries ..... *
Textile Machine Works ..... *
Textile Paper Products, Inc.... *
Textile Shield Co. 216
Theiler Corp., H. J. 203
Toledo Scale Company ..... *
Ton-Tex Corp. 206
Torrington Co., The ..... *
Trust Company of Georgia 93
Trutzschler & Co. ..... *
Tsudakoma Industrial Co., Ltd. ..... *
Turbo Machine Co. 60, 61
Tyer Rubber Company ..... *

U

U. S. Steel Corporation Stainless Steel Division 170, 171
Universal Winding Co. 46, 47
Uster Corporation 24, 25

V

Veeder-Root, Inc. ..... *

W

Want Ads 222
Ward Steel Company 184
Warner & Swasey Co. 150
Watson & Desmond ..... *
West Indies Chemical Works, Ltd. ..... *
West Point Fdy. & Mach. Co. *
Whitehead Die Casting Co. .... *
Whitin Machine Works 224
Whitinsville Spinning Ring Co. 195
Whitney Chain Co. 31
Wildman-Jacquard Co. ..... *
Wonalancet Company 206

Y

Young Aniline Works, Inc. .... *
Young Machine Co., F. A. ..... *

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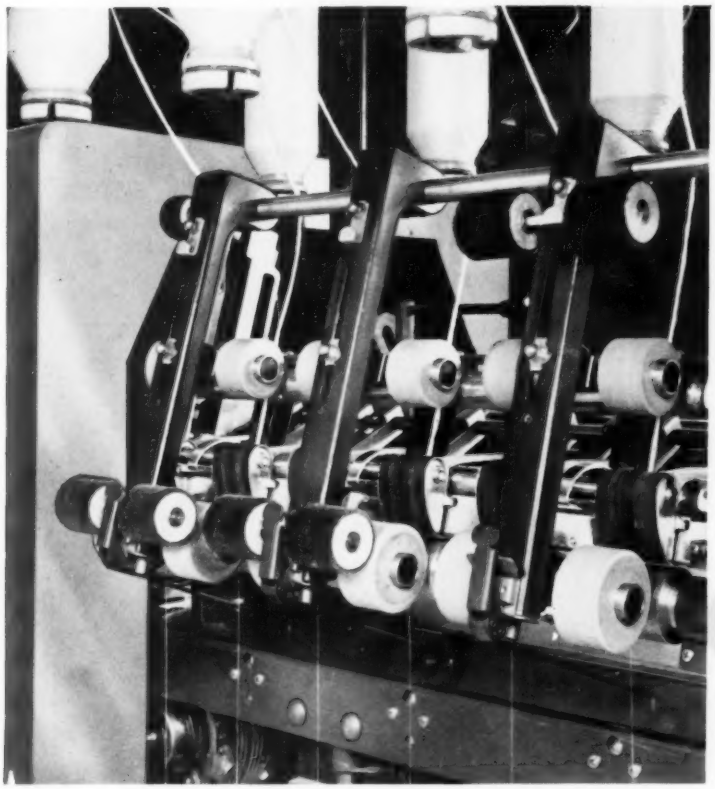

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